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Leersia oryzoides 312.

South Sea 530

Leersia Filipina 755

Leersia oryzoides 863

Leersia alterniflora 1115

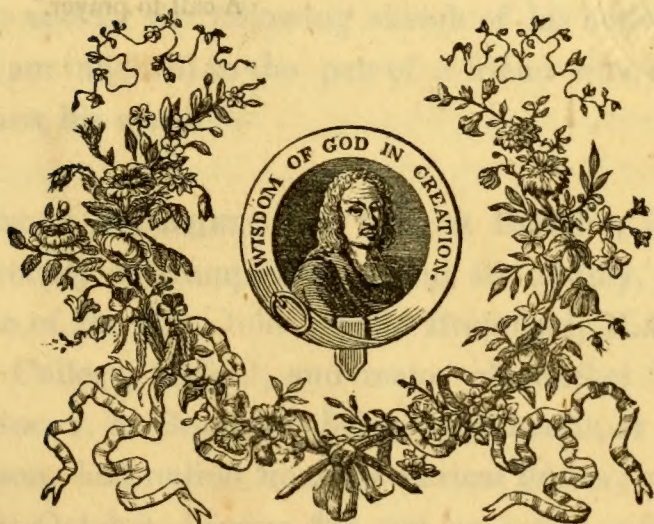
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THE
PHYTOLOGIST:
A
POPULAR
BOTANICAL MISCELLANY,

CONDUCTED BY

EDWARD NEWMAN, F.L.S., Z.S., &c., &c.

VOLUME THE FOURTH.



LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

M.DCCC.LI.

THE

PHOTOLOGIST

POPULAR

BOTANICAL MISCELLANY.

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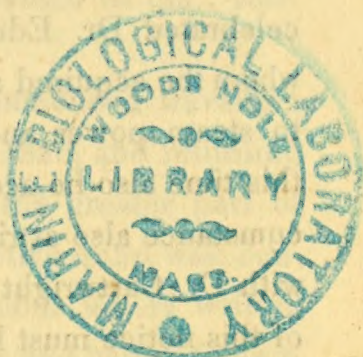
EDWARD NEWMAN, F.R.S., &c., &c.

“’Neath cloistered boughs each floral bell that swingeth,
And tolls its perfume on the passing air,
Makes Sabbath in the woods, and ever ringeth
A call to prayer.”

LONDON:

JOHN VAN NOORDEN, WATERLOO STREET, E.C.

PREFACE.



THE pleasure which I have always felt in penning a brief annual address to my readers, is on this occasion greatly diminished by the painful duty which devolves on me, of recording the loss of one of my ablest contributors and kindest friends. From its very commencement, Dr. Bromfield took the warmest interest in the success of the 'Phytologist,' and both by his personal recommendation, and by the powerful aid of his botanical knowledge, contributed equally to its popularity, and to its sterling practical utility. This talented botanist, and most excellent man, breathed his last at Damascus, on the 9th of October; and for the following sketch of his active and energetic career, I am indebted to the pen of a friend who enjoyed his intimacy and knew his worth:—

WILLIAM ARNOLD BROMFIELD was born at Bouldre, in the New Forest, in the county of Hampshire, on the 4th of July, 1801. He was the only son of the Rev. John Arnold Bromfield, M.A., formerly Fellow of New College, Oxford, and rector of Market Weston, in Suffolk. The Rev. J. A. Bromfield being in ill health at the time of the birth of his son, had retired from his clerical duties; and he died in the following October, leaving his son an infant, of only three months old.

At eleven years of age, William Arnold Bromfield was placed at school, at Tonbridge, in Kent, under the care of Dr. Knox, of that place. He remained here only about one year; but this short time was sufficient for him to receive impressions which much influenced his

tastes and pursuits, and probably also, in no small degree, his after career. This arose from his being at this time much noticed by the celebrated Dr. Edmund Cartwright, a friend of his mother's, from whom he acquired a taste for mechanics, and especially in reference to steam power and machinery, which he retained to the last. At this time also he acquired a strong taste for chemical pursuits; a circumstance also attributed by his family to his intercourse at this time with Dr. Cartwright. It is obvious that, at this early age, the subject of this notice must have shown no common degree of intelligence, to have gained the notice of so distinguished a genius as the justly celebrated Cartwright.

When about twelve years of age, he was removed from Tonbridge to Ealing, in the county of Middlesex, under the care of Dr. Nicholas, where he remained some years. He subsequently improved himself in his classical studies under the Rev. Mr. Phipps, in Warwickshire.

When released from the trammels of tutors, the love of chemistry, for which he had so early shown a liking, became much strengthened, and occupied much of his time and attention. To improve him in the study of this pursuit, he was, when nearly twenty years of age, placed as a pupil with Dr. Thomson, of Glasgow, then Professor of Chemistry in that University, under whose roof he remained two years, following his then favourite study, with the no small advantage afforded by the full use of the Professor's laboratory. These advantages were not lost, and his attainments in chemistry were very considerable. During this period, he attended the medical classes; and he did not finally leave Glasgow until he had taken the degree of M.D. Amongst the courses of lectures required for the medical degree, he of necessity attended that of botany; and this appears to have been his first introduction to the science in which he subsequently made so great acquirements, and did so much to advance. He was of too active a mind, and naturally too fond of science, to attend these lectures without some degree of interest; and, though previously uninterested in the science, he at this time collected and preserved some specimens, though as yet he evinced no decided partiality for botany.

Though a graduate in medicine, Dr. Bromfield never practised the

medical profession, from which circumstance the mistake often arose, to his own no small amusement, of his being addressed as the "Rev. Dr. Bromfield."

Shortly after his graduation, Dr. Bromfield commenced travelling on the Continent of Europe, leaving England in 1826, and returning home in 1830, after having visited France, and the greater part of Italy and Germany. During these travels, his active mind was constantly at work; and the numerous and voluminous letters written home at that time, evince that characteristic power and habit of observation which is still more observable in the correspondence of his after travels.

His first winter on the Continent was passed in Berlin and Hamburg, where he perfected himself in the German language, which he ever after spoke remarkably well, and where he became also well acquainted with the literature of that language.

His second winter was passed at Rome and Naples. While in Italy, he became well acquainted both with the literature and music of that country; but though well acquainted theoretically with the language, he never spoke it with ease. Dr. Bromfield's travels in Italy extended into Sicily.

The third and fourth winters, and the intervening period, of his tour were passed in France, chiefly in Paris and Montpellier, during which period the language of France became almost as familiar to him as his own. Dr. Bromfield's residence at Montpellier is interesting, from the fact of his having there made the acquaintance of M. Auguste de St. Hilaire and M. Dumal, the Professor of Botany, whose lectures he attended, and to whom he became much attached. It appears to have been at this time that Dr. Bromfield became more decidedly attached to botany. He had, it is true, now and then preserved a specimen whilst in Germany; but it was while enjoying the society of M. Dumal that botany took that hold of his mind and talents which it ever after retained.

From Dr. Bromfield's return to England in 1830 until 1832, he resided with his mother and sister at Hastings, Clifton, and Southampton. At this time (1832), he had the misfortune to lose his only

surviving parent. From this date till 1836, he was partly resident at Hastings, and partly at Southampton.

During the above period, *viz.*, from 1830 till 1836, entomology, as well as botany, much engaged Dr. Bromfield's attention. When this taste was first acquired is not known, though it appears likely to have commenced while on his continental travels. His attainments in entomology were very considerable, and by no means only, though principally, as regarded British insects.

In 1836, Dr. Bromfield became resident at Ryde, in the Isle of Wight; soon after which he conceived the idea of publishing a flora of the island, the plan of which was, however, ultimately extended to the whole county of Hampshire. From this time, botany became his leading pursuit and study, though by no means exclusively, as during his residence in Ryde he gave much attention to the study of climate, both as indicated by the atmosphere and deep springs, and still pursued his study of steam mechanics; a working model of some improvement, of his own invention, being unfortunately left incomplete.

Though the local flora was now the main object of his botanical studies, Dr. Bromfield was not indifferent to objects of interest growing further from home, and made frequent more distant excursions, sometimes with a friend, and sometimes alone, to verify the localities of any interesting species. As time passed on, he became less satisfied with his short excursions, and the love of travel worked strongly within him. A trip to Ireland in the autumn of 1842, to see the *Arbutus* growing on the hills of Killarney, for a time satisfied this desire; but craving to visit new and interesting scenes still further from home, on January 2, 1844, he started for a tour through the West-India Islands, visiting Barbadoes, Granada, Trinidad, Jamaica, Porto-Rico, and St. Thomas's.

Dr. Bromfield's attention, in this tour, was by no means confined to botanical investigations, though very principally directed to them. The habits and manners of the people, the sky, climate, and "aspects of Nature" generally, all claimed a share of his observation; and the voluminous letters written by him at this time are full of the most

valuable information on many subjects. So fresh and lively are his descriptions, that a short quotation from one of his letters will, no doubt, interest the readers of the 'Phytologist.' Writing from Jamaica, after leaving Trinidad, his favourite island, he observes:—"The suburbs of the Port of Spain are one continued garden of tropical fruits and flowering trees without end. The very streets abound with curious, inconspicuous weeds, of which one longs to know the name and uses. A beautiful mall lies parallel to the harbour, planted with a double row of native and foreign beauties; and Brunswick Square, higher up in the town, is a sweet, shaded place, where I used to delight to stroll, after sun-set, in the bright moonlight, watching the fire-flies as they gleamed momentarily amidst the deep gloom of the Bauhinias, Bignonias, and other trees that form the ornament of the place. A walk of three quarters of an hour from the water side will lead you up through any one of the long, regular, and straight streets of the town, across the grand savannah, to the mountain, and into woods filled with a thousand curious things, some of them old acquaintances in our stoves at home, but, oh! how much more developed in their free and genial native air! The mind experiences a kind of confusion, almost baneful, at the sight of so many objects crowding upon it at once. All having an equal claim to attention, it knows not on which to fix first, and has no time to examine anything minutely, so impatient is it to examine everything at once."

In the same letter, Dr. Bromfield writes:—"I have found the inconvenience arising from the want of ready and speedy mode of conveyance a most serious hindrance to the collecting of plants. Unless you sacrifice all other considerations and sight-seeing to that alone, there is no means of making even a tolerable harvest without remaining for some months in each place." Although, however, Dr. Bromfield's collections on this occasion fell short of his wishes, he brought home a considerable number of interesting specimens, as well as seeds, the proceeds of which are still growing in the garden at St. John's near Ryde.

After his return from the West Indies, he diligently applied himself to the local flora, for the next two years, when he determined to pay

a visit to North America. This journey occupied somewhat more than a year, his departure from England being on July 6, 1846, and his return August 3, 1847. During this period, he made extensive excursions in Canada, and through the States to New Orleans, and thence 200 miles up the Mississippi. Ample notes of his botanizing and observations on this occasion have been published in Sir William Hooker's 'London Journal of Botany.'

The next three summers were diligently spent in bringing forward the local Flora; but unfortunately it was yet incomplete when the love of travel again prevailed, and Dr. Bromfield once more left home for foreign parts.

On the 29th of September, 1850, he left Southampton for the East. On his way to Alexandria, the vessel touched at Gibraltar and Malta, at both of which places he passed a few hours in botanizing. Unfortunately, at that season the plants were not in condition for specimens; but he collected some seeds, which are now growing at St. John's. He arrived at Alexandria on the 17th of October, but did not remain there many days, as the cholera was at that time prevailing, the weather at the time being very close and damp. It was fortunate he removed quickly from this place, as, a few days after his departure, severe fever broke out in the Frank quarter of the city.

From Alexandria, Dr. Bromfield proceeded to Cairo, where he arrived on the 25th of October. This place he made his headquarters for a full month, during which he made many excursions in the neighbourhood. While here, he met with two gentlemen, who, like himself, were desirous of proceeding up the Nile. Having engaged each a native servant, on the 25th of November they started from Boulac, the Port of Cairo, on their upward voyage, in the 'Mary Victoria' Nile boat, which was the home and castle of two of them for more than half a year. On this voyage, they visited almost every place of interest, subsisting in great measure on the proceeds of their guns, until, on January 16, 1851, they arrived at Wady Halfeh, on the second cataract. Here they left their boat, and proceeded on their journey through the desert, on camels, sleeping commonly in the open air. The furthest point which appears to have been reached by the

travellers was Khartoum, whence they intended to take one or two days' exploring up the White Nile, but no account of their doing so has been received. While at Khartoum, they unfortunately slept in a house where was a case of severe small-pox, with symptoms of which, a few days after, one of the travellers was seized. His companions hastened with the sick man to Berber, where he unfortunately fell a victim to the violence of the attack, and was interred by his sorrowing friends in the burial ground of the Koptic Christians.

Dr. Bromfield and his remaining companion returned to their temporary home, the 'Mary Victoria,' which was awaiting them at Korosko, between the first and second cataract, on April 24, whence they proceeded on their return to Cairo, where they arrived on June 4. Most interesting accounts have been received of the botany, and the "aspects of Nature," in this interesting voyage. They are full of facts of the most lively interest, and contain observations of the greatest value. The travellers arrived at Cairo, and quitted their boat-home on June 4.

Dr. Bromfield again made Cairo his head-quarters while examining the surrounding regions; and he also from this point made an excursion to Suez, which place very much interested him, especially in reference to the passage of the Red Sea by the ancient Israelites.

From Cairo, our traveller proceeded to Damietta, on his way to Palestine. At this place, the most unfortunate detention occurred. Owing to a certain surfy bar, called the Bougaz, at the harbour's mouth, he was unable to reach the vessel which lay, awaiting her passengers and cargo, in the offing, until August 5, during which time, of daily expectation and daily disappointment, he was fearfully exposed to the risk of fever, sleeping either in an open boat, hoping to be taken on board the vessel by day-break, or else in a damp room, on the ground floor, by the water's edge.

From Damietta, he proceeded to Jaffa, where he arrived on the 8th of August, heartily rejoiced to have escaped the "Egyptian bondage" which so marred the termination of his travels in Africa.

While travelling in Upper Egypt, the Arabs gave to their interesting visitor the Arabic name of "Abou Hasheesh," which signifies "Father-of-grass," a name by no means inappropriate.

Of Dr. Bromfield's travels in Palestine little is yet known : it is to be hoped his journal, when it comes to hand, will reveal more of his last days and thoughts. He passed some little time at Jerusalem, which he reached on the 14th of August ; and he is supposed to have visited Bethlehem, Sychar, the Dead Sea, and Jericho. He went to Beirout, which he intended leaving on the 28th of September, for Damascus and Baalbec, after which he meant to return to Beirout, and from which he intended to return to Europe by the first opportunity.

At Damascus, he arrived on the 5th of October, being at that time dangerously ill, either with malignant typhus fever, or, as was supposed at Damascus, from the effects of the sun while journeying from Beirout to Baalbec. While ill, he was most assiduously and kindly attended on by Mr. G. Moore, an English traveller, and by the Rev. Mr. Barnett, an American missionary. He only survived his arrival at Damascus a very few days, having sunk on the 9th of October. His remains were shortly after interred in the Christian cemetery, without the city.

Dr. Bromfield was never married, his nearest surviving relative being an only sister, to whom he was devotedly attached, and with whom, with the occasional exceptions of the periods of his travels, he had lived from the time of his mother's death, in 1832.

Dr. Bromfield's additions to the British flora are :—*Spartina alterniflora*,* which he discovered at Southampton, in the year 1836 ; *Myriophyllum alterniflorum*,† near Brading, in the Isle of Wight, about 1846 ; *Calamintha sylvatica*,‡ a new species, in the Isle of Wight, in 1843 ; and *Atriplex hortensis*,§ a doubtful native, near Ryde, in 1845. He also much assisted the Rev. W. Leighton in distinguishing *Prunus Cerasus*¶ from *Prunus Avium*. Lastly, in 1850, he first drew attention to a form of *Luzula*** which he had observed some years in the Isle of Wight, and which, should it ultimately prove distinct, he intended naming *Luzula Borreri*, as a name suitably accompanying that of *Luzula Forsteri*.

* Hooker's 'Companion to the Botanical Magazine,' ii. p. 254.

† Phytol. iii. 369.

‡ *Id.* ii. 49.

§ *Id.* ii. 330.

¶ Leighton's Fl. Shrop. p. 526.

** Phytol. iii. 983.

Of the value of his botanical observations the readers of the 'Phytologist' are well aware. It is a great loss to science that his Flora was not completed and published. It is hoped, however, that both this and his correspondence and journals will in some manner be edited, as they are of far too great value to be lost to the public.

This notice would be incomplete without some reference to the care with which Dr. Bromfield drew up his descriptions, and selected and preserved his specimens of plants.

With respect to describing, he was in the habit, when about to draw up a description, of obtaining an *immense* number of specimens from different localities, that he might examine the *species*, and not merely individuals, or local forms. These he would examine, by the assistance of various authors, both British and foreign; and as his library was one of very rare extent, by this means he obtained the suggestions of very many botanists. This done, he also carefully scrutinized, to see if any characters yet remained undetected by his predecessors. Being now thoroughly acquainted with the plant, he, without further reference to the books, drew up his descriptions from the plants themselves. His descriptions are therefore of very great value, from the amount of care and labour bestowed upon them.

With regard to specimens for the herbarium, he was no less careful, and probably no botanist ever took so much care in the mode of preserving. The result is, that his specimens portray the characters and aspect of the living plants to a degree, probably, not to be met with in any other collection.

A powerful intellect, with great powers of observation, accompanied with an intense regard for peace, and the most rigid truthfulness, and very strong affections, constitute the character of this most amiable of men. His love of truth was so remarkable, that it seemed, in every inquiry, to place him above any the slightest bias; and this fact adds immensely to the value of his observations. His zeal also knew no bounds, and hence, alas! his untimely loss! He will long be remembered, and his labours be always highly valued, by all of kindred pursuits; and his memory will ever live in the hearts of those who had the happiness to enjoy his friendship.

WHEN, in 1844, I commenced the 'Phytologist,' which has now appeared, with the utmost regularity, for one hundred and twenty-seven months, there was no journal which could, in any respect, be considered as competing with it for public favour. The 'Annals of Natural History,' indeed, dragged on a languid botanical existence; its papers on that science being few, intensely technical, and far between. Now we have three additional monthly journals, exclusively botanical, and one semi-botanical, in addition to the 'Transactions of the Linnean Society.'

Robert Brown, the greatest of all our botanists, still stands by the 'Transactions.'

Sir William Hooker and his friends have the 'London Journal of Botany and Kew Garden Miscellany.'

Mr. Babington and his friends have the 'Annals.'

Mr. Henfrey and his friends have the 'Gazette.'

Mr. Moore, of Chelsea, has the 'Gardener's Magazine of Botany.'

Messrs. McIntosh and Morris have the 'Naturalist.'

I am quite willing to believe that, in some of these instances, a pure love of the science is the mainspring of action; but I fear that, in others, a mistaken and very exaggerated view of the profits of the 'Phytologist' has induced what, in every instance, must be characterized a friendly competition. Let me assure the editors, and sub-editors, and assistant editors, that my feeling is as friendly as their own; and that I not only take, but read, every one of their periodicals, and always comment approvingly on such of their contents as I think likely to recommend them to the favourable notice of my readers. Let me also add, as a word of advice to those who are less experienced than myself in thus catering for a botanical public, that perseverance and liberality are the great secrets of success. It is a mistaken notion, that because our readers are few labour is unnecessary; and that the smallest possible pennyworth is to be given for the penny. In my own instance, I have rejected this principle: I have made the volume for this year more bulky than that of any previous

year; and I know that this liberality has been justly appreciated. May every success attend all my brother journalists; and may their numbers increase, year after year, and their coffers be abundantly replenished by their success. I shall continue to give, in each consecutive number, a full account of the contents of all botanical journals during the current month.

Of the papers which treat so pleasantly of the botany of the field, which are so redolent of the sweet breath of wild flowers, I need say nothing: they always find delighted readers, and I only wish they were more abundant. Those by Mr. Lees, the Rev. Mr. Bree, the Rev. Mr. Hore, Mr. Varenne, Mr. Gibson, Mr. Bennett, &c., are remarkably agreeable contributions, but do not require that synoptical arrangement which appears necessary for those which contain facts that are to be permanently preserved. These I have attempted to arrange under four heads:—I. Proposed Additions to the British Flora; II. Additional or Rediscovered Localities of Rare Plants; III. Critical Remarks on Disputed or Doubtful Species; and IV. Observations on Structure, Physiology, and System.

I. *Proposed Additions to the British Flora.*

Rubus imbricatus.—In a report of the Proceedings of the Botanical Society of Edinburgh (iv. 156), Mr. Hort describes a supposed new species under this name.

Lastrea glandulosa.—I fear this plant, which I have noticed as possibly distinct (iv. 256), is not sufficiently so to warrant its adoption as a species. A succession of careful observations is required before the point can be determined.

Luzula Borreri.—Since the publication of the late Dr. Bromfield's admirable and elaborate description of a new *Luzula* (iii. 985), Mr. Babington has described the same plant, under the name of *L. Borreri*, in the third edition of his Manual; and Mr. Purchas has found it pretty generally distributed about the neighbourhood of Ross, in Herefordshire, and always in company with its allies, *L. pilosa* and *L. Försteri* (iv. 307).

Athyrium ovatum of Roth.—This elegant and very distinct species of *Athyrium* has been found, during several successive years, by Miss Wright, of Keswick (iv. 368). Since the record of this discovery was published, Mr. Babington has, in a private letter to myself, expressed doubts of the identity of the Keswick plant with Roth's species, on account of its discrepancy with a figure to which Roth refers; but a careful reperusal of Roth's elaborate description has confirmed me in the belief that the plants are positively identical.

Cystopteris Dickieana of Sim.—This, although described so long since as 1848, by Mr. Sim, a most intelligent nurseryman and acute botanist, residing at Foot's Cray, has, I believe, never been admitted by our publishing botanists as entitled to specific rank. In this respect, a curious revolution has taken place in the views of our highest authorities. Twenty years ago, nearly every conspicuous deviation from the normal form of *fragilis* was made a new species; now, not only are they restored to their proper parent, but a great disinclination prevails even to admit forms that have never been associated with *fragilis*, or any other species (iv. 369).

Polypodium alpestre of Koch.—Mr. Watson has added this extremely beautiful species to our list of indigenous ferns. He found it in 1844 (not 1846), in Canlochen Glen, Forfarshire, and has gathered it in two other localities (iv. 370).

Cuscuta Hassiaca of Koch.—Mr. Varenne, a botanist to whom I have on many previous occasions been indebted for valuable observations on our native plants, records (iv. 382) the discovery of a new *Cuscuta* at Witham, in Essex. Mr. Watson has ascertained it to be the *Cuscuta Hassiaca* of Koch, who describes it as being, on the Continent, parasitical on *Anthemis Cotula*, *Sonchus asper*, *Galium verum*, *Medicago sativum*, and other plants. At Witham, Mr. Varenne has found it on the lucerne only, and mentions that its flowers exhale a perfume like that of *Heliotrope*.

Potamogeton trichoides of Chamisso.—I believe this aquatic was first

described by Mr. Babington, in the third edition of his *Manual* (343). It was characterized by Chamisso, in the 'Linnaea' (ii. 4), and belongs to that division of the genus which has all the leaves submerged, alternate, and linear. It differs from its congener and near ally, *P. pusillus*, of Linneus, in having the leaves one-nerved. Chamisso and Schlechtendal, as well as Hooker & Arnott, regard *compressus* and *pusillus* merely as forms of the same plant. *P. trichoides* has only been found in the vicinity of Norwich.

II. *Additional or Rediscovered Localities for Rare Plants.*

Euphorbia Peplis.—Mr. E. T. Bennett (iv. 1) restores this local plant to its old Cornish locality on Marazion Green, where it had been supposed extinct.

Cystopteris montana.—Mr. Borrer (iv. 7) and Dr. Arnott have found this fern in the range of mountains between Glen Dochart and Glen Lochay, on the same spot where Messrs. W. Gourlie and W. Adamson found it in 1841. Hooker & Arnott, in the sixth edition of the 'British Flora,' spell the name of the place thus:—"Corrach-Uachdar;" but Mr. Borrer understood the name of the mountains as "Meal Oufillach," and of the ravine, "Corrach Dh'Oufillach," as nearly as he could express in writing the pronunciation of the native from whom he received the information.

Menziesia cærulea.—This plant also was rediscovered by Mr. Borrer (iv. 7), in Drumochter, or Drum Uachdar, on the confines of Atholl and Badenoch. Mr. Borrer found several tufts, growing among the heath and cranberry. I may mention that the late Mr. Cameron, formerly of the Botanic Garden at Birmingham, told me, some years ago, that he had many times visited a spot where it grew in some abundance, that he could find it at any time, and that there was no probability of its becoming exterminated. Mr. Cameron, I may add, was well known as a man of the most scrupulous veracity.

Adiantum Capillus-Veneris.—Mr. T. B. Flower has found this beautiful fern at a place called Mewstone, or Mudstone (iv. 51), on the south coast of Devon.

Lastrea cristata.—The Rev. W. S. Hore records (iv. 95) the discovery of a new locality for this fern, *viz.*, the waste land adjacent to the sheet of water called Surlingham Broad, near Norwich.

Laminaria longicruris.—The Rev. George Harris, of Gamrie, Banffshire, mentions (iv. 124) having found this Alga in his own neighbourhood. The specimen was about three yards in length, and had evidently been broken.

Potamogeton prælongus.—The Rev. R. C. Douglas records (iv. 128) the discovery of this aquatic in Staffordshire. It grows in great abundance in the river Sow, at Stafford, in company with *P. Zosteræfolius*.

Udora Canadensis.—Dr. Johnson argues its comparatively recent introduction in Berwickshire (iv. 151). Mr. Kirk contends (iv. 274) for its claim to be considered native in Britain. The Rev. W. H. Hind records (iv. 277) its discovery at Cambridge, in a ditch by the railway-station. Mr. Babington (iv. 374) attributes this station to the introduction of the plant into a stream near the Botanic Garden, by the late Mr. Murray. It now abounds in the river Cam, all about Cambridge. I would ask, is there any evidence to show that it did not abound there prior to its introduction by Mr. Murray? Mr. Foggitt records (iv. 365) its occurrence, in the greatest abundance, in the river Wiske, near Thirsk, in Yorkshire, and believes it truly indigenous.

Orchis hircina.—Mr. G. B. Wollaston (iv. 169) records the rediscovery of this, the rarest of British Orchideæ, at its old Kentish station, where it had long since been reported to be extinct. The specimen was found on Good Friday, and I had the pleasure of seeing it on the 18th of June, it having then thrown up a magnificent spike, but the flowers were still unexpanded.

Leersia oryzoides.—Mr. A. W. Bennett records (iv. 312) the discovery of this extremely local plant in a new locality, *viz.*, in the river Mole, at Brockham Green, Surrey. Mr. Watson, following up the discovery, has found it again, in company with *Polygonum mite*, on the muddy margin of the same river, almost close to the foot-bridge over that river, and almost midway between East Moulsey Church and Ember River. “Other localities,” says Mr. Watson, “will probably be found between Reigate and Moulsey, along the course of the river Mole, and between Hampton Court and London, along the course of the Thames. The plant grows in tufts, but the outer stems *do* really become somewhat procumbent at the base (Bab. Man. edit. 3, p. 385), and *take root* from the lower joints.”—*Bot. Gaz.* 1851, p. 154.

III. *Critical Remarks on Disputed or Doubtful Species.*

Lastrea recurva.—Mr. E. T. Bennett has some interesting observations on the distinctness (iv. 4) of this plant. It is made to plead its own cause at p. 48. The Rev. W. S. Hore supports the plea (iv. 96), and pronounces it “the most distinct of our indigenous ferns,” as also does Mr. R. White (iv. 108) and the Rev. W. T. Bree (iv. 145).

Lastrea uliginosa.—Mr. John Lloyd, the original detector of this fern, agrees in favour of its distinctness (iv. 22). Mr. Charles Wood takes a similar view (iv. 54). It is mentioned by myself that Professor Braun had distinguished this fern in Germany prior to its discovery in England (iv. 55). Mr. Joseph Bray gives his opinion that it is distinct (iv. 72). The Rev. W. S. Hore expresses his dissent from this view (iv. 96), as also does Mr. Wilson (iv. 105). Mr. Thomas Moore, in a report of the Proceedings of the Botanical Society of Edinburgh (iv. 149), unhesitatingly describes it as a variety of *L. cristata*. And finally, Mr. Doubleday, on the wrapper of the July number, says:—“I unhesitatingly state that it is a species totally distinct from *L. cristata*.” In addition, I may

remark that Hooker & Arnott (B. F. 570) declare it to be the type of their *Aspidium spinulosum*; and finally, that Mr. Babington (Man. 410) places it as a variety of *cristata*. Altogether, the science of pteridology is in as pretty a jumble on this point as need be desired.

Species of Hieracium.—On this genus are some abridged remarks (iv. 139) from a paper by Mr. Backhouse, in the ‘Botanical Gazette,’ and again in a report of the Botanical Society of Edinburgh (iv. 151).

Prunus Aria.—Mr. Babington, in the ‘Botanical Gazette’ for March (abstract, Phytol. iv. 110) suggests the division of *P. Aria* into *P. Aria* and *P. scandica*; and in his subsequently-published Manual (111) he gives them as distinct species, observing that “the continental distribution shows that neither *P. scandica* nor *P. finnica* can be hybrids.” Of these three species Hooker & Arnott give but one, *P. Aria*, making three varieties:— α . leaves slightly cut and lobed, usually white underneath.— β . leaves cut and lobed, usually less white beneath = *P. intermedia*, *Ehrh.*— γ . leaves pinnatifid, and often pinnate at the base = *P. pinnatifida*, *Ehrh.*; adding, “to us β . appears to be a fertile hybrid between the type of this species and *P. torminalis*, and γ . another between this and *P. aucuparia*.” I confess to a strong disinclination to adopt hypotheses so utterly unsupported by observed facts.

Cerastium pumilum.—Mr. Babington has a few comments (iv. 34) in the ‘Botanical Gazette’ for January on this doubtful species, observing that Hooker & Arnott have placed it as a variety of *triviale*.

Species of Carex.—In the report of a meeting of the Botanical Society of Edinburgh, Mr. M'Laren has a paper on the British species of *Carex*, grouping them somewhat differently from Reichenbach, the subgenera not being made to depend on the number of stigmas (iv. 44).

Fumaria parviflora.—Mr. G. S. Gibson records (iv. 65) the finding of this species, in company with *F. Vaillantii*, at Settlebury,

in Essex. He cites Mr. Henfrey's characters for distinguishing these species from each other: in *Vaillantii* the leaves have broader segments, are of a bluish, darker green, often tinged with purple; the flowers are purplish, never white, but fading to somewhat of that colour; the habit is diffuse and spreading; the seeds appear similar. It may be here observed that Hooker & Arnott (Brit. Flor. 19) do not recognize these species, but that Babington (Man. 15) gives them, without hesitation, as distinct, drawing a distinguishing character from the comparative length of the fruit-stalk. This in *parviflora* is *shorter* than the obovate, pointed fruit, *and equaling the bract*; in *Vaillantii* it is *longer* than the fruit, and *twice longer than the bract*.

Arctium Lappa, &c. (iv. 66) Mr. G. S. Gibson has given some attention to the genus *Arctium*, without arriving at any definite conclusion. He observes that although major or *Lappa*, and minor or *Bardana*, are very different in appearance, yet they are so closely connected by forms of intermedium, that it is difficult to say to which some specimens are to be referred. He would prefer a threefold to a twofold division of the genus. Hooker & Arnott (Brit. Flor. 219) give *Lappa* as the species, minus as the variety, and leave intermedium unnoticed. Babington (Man. 179) gives *majus* and *minus* as distinct species, and intermedium as a variety of the latter.

Carduus crispus.—Mr. G. S. Gibson records (iv. 66) that Mr. J. Clarke has noticed a thistle which, in some respects, corresponds with *C. crispus*, described, but not recorded, as British by Sir J. E. Smith; but the flowers are not clustered, as stated in Babington's Manual. Mr. Gibson suggests that Smith's *crispus* may be Babington's *acanthoides*, and *vice versâ*. I may remark that Hooker & Arnott (Brit. Flor. 182) give *crispus* as a species, and make *acanthoides* a variety thereof; while Babington (Man. 220) makes *C. acanthoides* the species, and gives *C. crispus* simply as a synonym.

Narcissus lobularis.—In a report of the Proceedings of the Botanical Society of Edinburgh (iv. 157), Mr. J. T. Syme gives a notice of this plant, and remarks that it differs from *N. Pseudo-narcissus*, in having the cup divided into six distinct lobes, and of the same colour as the segments, which are broadly ovate, and rather sharply acuminate.

Species of Salicornia.—At p. 208 appears a valuable and comprehensive abstract of a paper by Mr. Joseph Woods, on the various British forms of the genus *Salicornia*, as observed by himself, principally on the coasts of Hampshire and Sussex. The author considers *S. procumbens* a distinct species; *S. radicans* and *S. lignosa* certainly distinct from *S. herbacea*; but whether they are so from each other, and whether, if that be the case, *S. lignosa* ought not to be considered as a variety of *S. fruticosa*, *L.*, and the plant with tubercled seeds to be called *S. megastachya*, he does not feel competent to decide. The other forms of *S. pusilla*, *S. intermedia*, and *S. ramossissima* may, perhaps, be varieties of *S. herbacea*; but this also is a subject for further investigation.

Euphorbia stricta and *E. platyphylla*.—Some admirable remarks on these species, from the pen of Mr. Hort, are extracted from No. 26 of the 'Botanical Gazette.' Hooker & Arnott (Brit. Flor. 367) have only one species, *E. platyphylla*, but remark that "a plant agreeing with Reichenbach's figure of *E. stricta*, and differing, by the leaves being narrowed above the base instead of narrowed gradually to the base, from the common form of *E. platyphylla*, occurs between Tintern and the Wyndcliff." This, however, does not meet the case, as will be seen by a reference to Mr. Hort's paper. Babington (Man. 281) gives the species as distinct.

IV. *Observations on Structure, Physiology, and System.*

Mr. Henfrey (iv. 23) has some observations, extracted from the 'Proceedings of the Linnean Society,' on the development of the spores and elaters of *Marchantia polymorpha*.

Mr. Miers' paper on the affinities of Triuridaceæ appears, in abstract, at p. 26, and contains some novel and highly valuable observations on the intimate structure of a tribe of plants whose history he has, at different times, most ably illustrated.

M. Liebmann's curious and most interesting observations on a female plant of one of the Cycadeæ which produced ripe seeds without impregnation, will be found at p. 26.

Mr. Brown's interesting letter to Captain Sir Francis Beaufort, on the origin and mode of propagation of the Gulf-weed, will be found, *in extenso*, at p. 28. It is particularly recommended to the attention of botanists.

Mr. Holdsworth's observations (iv. 30) on dry-rot, as observed in the church of King's Wear, in Devonshire, are extremely curious; and the idea that a good supply of air accelerated its development is at variance with general opinion. The paper was read before the Linnean Society, and is reprinted from the Proceedings of that body.

Dr. Lankester's paper (iv. 32) on a peculiar structure of cells on the surface of *Callitriche verna*, is obtained from the same source.

Mr. Wilson has two papers on mosses the first (iv. 67), treating of the spirilla, or spermatozoides, and the second (*id.* 69) on a monstrous specimen of *Tortula*, described by the late Mr. E. J. Quekett, in the 'Transactions of the Microscopical Society,' and noticed also in Lindley's 'Vegetable Kingdom.' Mr. Wilson had received an example of the supposed monstrosity, and pronounced it to be *Ceratodon purpureus*, and not *Tortula*, and to possess no anomalies, or even remarkable character.

Mr. J. Quekett describes (iv. 88), in the report of a meeting of the Microscopical Society, what appeared to him a new fact in vegetable physiology, *viz.*, the unrolling, in a spiral manner, of the membranous wall of an elongated cell.

Mr. Benjamin Clarke's paper on the position of carpels, read before the Linnean Society, and subsequently noticed in the Proceedings of that Society, appears in abstract at p. 204, and will be read with great interest by all vegetable physiologists: it is intituled "Memoir on the position of the Carpels when two and when single, including Outlines

of a new Method of Arrangement of the Orders of Exogens, and Observations on the Structure of Ovaries consisting of a single Carpel."

Dr. Drummond has four papers; the first (iv. 211) is in reference to the observations on his views of botanical systems, contained in a notice of Hooker & Arnott's 'British Flora;' the second (iv. 309) is on Natural Systems of Plants; the third (iv. 360) is entitled "Casual Remarks on Morphology," and combats the doctrine as now generally held; and the fourth (iv. 365) is a reply to a review of his 'Observations on Natural Systems of Botany.'

Dr. Vriese's note (iv. 215) on the temperature of the male inflorescence of Cycadeous plants, is the record of a remarkable and unaccountable fact, well worthy of further investigation.

Dr. Balfour (iv. 230), in the report of a meeting of the Botanical Society of Edinburgh, has some remarks on the glandular stipules of Cinchonaceæ, detected in twelve species: the glands were found to secrete a gummy fluid, and in some species this secretion was beautifully coloured.

Dr. Lankester (iv. 288) read a paper at the last meeting of the British Association for the Advancement of Science (for the report of which I am indebted to the pages of the 'Botanical Gazette'), "On the Theory of the Formation of Wood and the Descent of the Sap in Plants;" and a discussion followed in which Professor Henslow, Mr. Huxley, Prof. Asa Gray, and Dr. Lankester took part.

Mr. Luxford has some valuable observations (iv. 292) on the structure of Ascidia and Stomata of Dischidia Rafflesiana, penned more particularly with reference to the paper by the late Mr. Griffith on that subject, lately published in the 'Transactions of the Linnean Society,' and from which some lengthened extracts are given at p. 265.

Mr. D. Moore, of the Dublin Glasnevin Garden, contributes a valuable paper (iv. 345) on the formation of wood in plants, detailing the result of a series of experiments made in the Gardens between the years 1830 and 1851.

EDWARD NEWMAN,

Devonshire Street, Bishopsgate, November, 1851.

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ADVERTISEMENT.

'THE PHYTOLOGIST' will be continued both as a monthly and an annual publication. As a monthly, it will contain thirty-two pages of letter-press, occasionally accompanied with figures of New British Plants; it will be on sale two days before the end of every month; and will be charged one shilling. As an annual it will be sold on or about the 1st of December; will contain twelve monthly numbers, bound and lettered uniformly with the present volume; and will be charged thirteen shillings. An alphabetical list of Contributors is published once in the year.

THE PHYTOLOGIST

FOR 1851.

Restoration of Euphorbia Peplis to one of its old Localities, with Observations on a few other Cornish Plants, found in the early part of October, 1850. By EDWARD T. BENNETT, Esq.

IN the appendix to the 'Guide to Penzance and its Neighbourhood,' the botanical portion of which is understood to be edited by that acute observer, John Ralfs, the *Euphorbia Peplis* is stated to have disappeared from its former locality on Marazion Green, which is the designation of the grassy, sandy shore extending from the eastern extremity of the town of Penzance to St. Michael's Mount, and where I know it has recently been searched for in vain by several good botanists. I thought it would be interesting to the readers of the 'Phytologist,' and to the lovers of our more local plants, to know that it has again appeared there this season, having had the pleasure to detect a fair number of specimens, growing on the rough, sandy ground, quite at the verge of the vegetation, and confined to a very limited area along the beach, on the 8th of last October.

We were much too late in the season to expect to find many of the Cornish rarities; but it may be interesting to record the permanence of some of the localities, and at how advanced a period in the year several plants of very local distribution may still be picked up, under a very limited command of time and opportunity.

One of our first objects was to see and gather *Erica vagans*. We proceeded accordingly to Hayle, and then directed our steps to Connor Downs, nearly along the line of the railway, towards Camborne. About two miles from the Hayle station we pounced upon the first small patch of an unmistakably new heath, at the foot of a bank along the side of the road. This was seized upon as a great prize,

little knowing the treat that was just in store for us. A few yards further on a lane crosses the road. Right and left, immediately on entering it, the banks of this lane were covered with masses of this fine heath, many bushes more than two feet in height, a little past perfection, but the lowlier ones, with their beautiful, crowded tufts of penultimate blossoms, of every variety of hue, from pure white, through all the intermediate shades to dark pink, still in the highest condition. The common, also extending on either side of the lane, was one blaze of bloom. We had no idea before of a rare or local plant being anywhere found in such extreme abundance, its profusion being quite equal to that of our ordinary heaths in their most favoured localities; and the pleasure was equal to the surprise. Here we regaled ourselves, filling our boxes with the most lovely and attractive specimens, without any conscientious scruple of injury or extermination, and without any fear that we were robbing an after-comer, or marring the hopes of the following year. It is equally abundant on Goonhilly Heath, near the Lizard, giving beauty to what would otherwise be a wide extent of most barren and unsightly moor, and it ends as abruptly a little before the 5th milestone from Helston, beyond which, on the road from the Lizard to Helston, we did not observe a single specimen.

Polygonum Raii is found on Marazion Green, and *Cynodon dactylon* abundantly at one spot, but at this advanced period of the year it was somewhat dry and withered.

Briza minor is abundant and very fine on the rich, cultivated soils about Penzance.

Bartsia viscosa occurs in the salt-marsh near Marazion, and in various other places.

Diplotaxis muralis on the causeway at Hayle.

Euphorbia portlandica on the cliff between Hayle and St. Ives.

Sibthorpia Europæa is abundant on moist, shady banks throughout the district.

Pinguicula lusitanica we found in the bog on the right hand side of the road to St. Just, and more abundantly on Chyanhal Moor, on the top of Paul Hill. The pools also afforded *Limosella aquatica*, past flower, and *Pilularia globulifera*.

Illecebrum verticillatum forms a complete carpet in boggy spots of the same locality, and in many other parts.

Radiola millegrana is fine and large, looking like a loaded miniature fruit-tree, on the dry, sandy spots, in similar situations.

Lepidium Smithii occurs in several stations.

Daucus maritimus on the cliffs near the Logan Rock, at the Lizard, and elsewhere.

Lavatera arborea is seen in many places along the cliffs, as at Mousehole and near the Lizard, but everywhere in the cottage-gardens as well.

Erodium moschatum is frequent about Mousehole, Cadgewith, and other places.

Erodium maritimum on St. Michael's Mount, at Lamorna, Ruan Minor, and especially fine and abundant upon a loose stone-wall opposite some fishermen's cottages at Lenner Cove, near Whitesand Bay.

Centranthus rubra grows plentifully in waste ground about Cadgewith, and though seen in the neighbouring gardens, it seems, from its perfect naturalization, to have as much claim to be deemed an escape out of nature into gardens, as a garden escape.

Foeniculum vulgare occurs in various rough-looking places, apparently wild.

Tamarix anglica attains the size of a timber-tree near the extreme south, along the coast between Cadgewith and Landewednack, and although these individuals were probably planted, there appears no reason to doubt its nativity in several places. Its beautiful, feathery branches were just putting out their blossoms.

Raphanus maritimus, with its singular-jointed pods, and pale-yellow flowers, is abundant along the top of the cliffs between Cadgewith and the Balk.

Herniaria glabra on a bank near Cadgewith flagstaff, and again in Caerthillian, the name of the first valley sloping down to the sea west of the Lizard lights.

Senebiera didyma is met with on waste ground and old walls near Landewednack, and about Penryn.

Anthyllis Vulneraria, var. *Dillenii*, with fleshy leaves and pinkish flowers, was gathered on Asparagus Island, in Kynance Cove.

Arenaria verna, var. *Gerardi*, apparently a distinct plant, grows among the turf all along from Caerthillian Valley to Kynance Cove.

Corrigiola littoralis is found in plenty, in some places nearly covering the ground, on the shingly margin of Loo Pool, near Helston.

Linum angustifolium is scattered all over the district; *Rubia peregrina* occurs in various places; and an *Erythrea* is frequently met with, of smaller habit and different appearance from our common inland one, which may be *E. latifolia* or *E. linarifolia*, or both.

One or two words on the special ferns of the district. In some low, dropping caves between Hayle and St. Ives, *Adiantum Capillus-Veneris* grows in tolerable abundance, and perhaps finer than in any other of our native habitats. Fortunately some of it is out of reach, and it is extending itself along the face of the cliff. *Asplenium marinum* occupies all the crevices among the huge piles of rocks about the Logan, and in numerous other places along the coast. It covers the roof of the great cave at Mousehole with a magnificent drapery, but the finest are here quite inaccessible. We have fronds from the rocks at Lamorna measuring twenty-one inches in length. *Osmunda regalis* is abundant in most of the low, boggy parts, and in some situations attains an extraordinary height. At Gurnard's Head we saw it in the unusual position of growing on the side of a perpendicular cliff, washed by the salt spray, along with *Asplenium marinum*. *Lastrea recurva*, which we first met with near Truro, is found, more or less, all round the immediate vicinity of Penzance. Beyond Madron, about two miles northward, it becomes extremely abundant. There can be no doubt of the specific distinctness of this highly beautiful fern when seen luxuriating in a natural habitat. In the lanes here it covers the banks, and occupies the interstices of the stone hedges, with its bright-green, *triangular* fronds, peculiar *crisped* appearance, narrow, concolorous, *lacinated* scales, and sub-prostrate habit, almost to the exclusion of any other species. Occasionally, however, we found a plant or two of *L. multiflora* or *L. spinosa* in company, which only served to render the distinctions more obvious. The glory, however, of this district is *Asplenium lanceolatum*. It grows on the walls and hedge-banks almost all about Penzance, but much more sparingly on the eastern side, and towards Helston and the Lizard it almost disappears. In the parish of St. Just, as you proceed westward, it seems to become more and more abundant with every step. We frequently observed this fern covering the wall or bank on one side of the road, while *Lastrea recurva* clothed the other exclusively, but in other spots they grew friendly and intermixed. From a hole in a bank, about half a mile from the sea, we drew out a single root, upon which, after reaching home, were counted seventy fronds, and then, getting tired and confused, it was given up. Still nearer the sea this fern formed the entire covering of the various loose stone-walls, along several miles of the country, with its green and vigorous fronds, and but rarely presented that singularly shrivelled appearance, which is so remarkable a characteristic in most of its Welsh stations.

This slight sketch of a few days' October's botanizing would not be complete without stating what we did *not* find. We walked at least five and twenty miles about the neighbourhood of Truro, and from Falmouth through Penryn, towards Carclew, which are the given localities, in search of *Erica ciliaris*, but without success, probably from being without sufficiently specific directions, for we can hardly think but that it must still have held out its terminal whorl of large, purple bells, still less that we should have overlooked it. We searched incessantly for the rare *Trifoliums* of the Lizard district, or any remnants of them, but without being able to detect any unrecognized relics. This we reconciled with the lateness of the season, by apprehending that they may all dry away early and disappear. We could not discover even the remains of *Asparagus officinalis* on the island in Kynance Cove, but had previously found a few prostrate stems in the locality near Cadgewith. We were struck with the great scarcity of *Lastrea Oreopteris*, having seen it but in one spot, and that very poor and dwarfed, over a large extent of very likely ground, and likewise with the entire absence of *Cystopteris fragilis*, and of *Polypodium Dryopteris* and *Phegopteris* from all the rocky, watered glens and valleys, and also of *Asplenium Trichomanes* and *Ruta-muraria*, as far as we observed, though the three latter, I believe, grow in the county.

EDWARD T. BENNETT.

London, November 16, 1850.

Worcestershire Habitat for Villarsia nymphæoides.

By GEORGE REECE, Esq.

I HAVE much pleasure in sending you a Worcestershire habitat for this rare aquatic plant. I met with it in the river Avon, between Pershore and Eckington, in the month of June last, in some abundance, but not in the best condition, the river having been subject to a flood only three or four days previously.

GEORGE REECE.

Worcester, October 16, 1850.

Contents of the 'Botanical Gazette,' No 24, December, 1850.

On the Ciliary Motion of Pollen Grains ; by Prof. Schenk.

On the Stomata and Epithelium of *Niklea syncarpa* ; by Dr. Itzigsohn.

On the Ciliated Epithelium of *Chora fragilis* ; by Dr. Itzigsohn.

Note on *Hypericum dubium* and *H. maculatum* ; by Charles C. Babington, M.A.

On the Morphology of Tubers and Bulbs ; by T. Irmisch.

Literature : 'The London Catalogue of British Plants,' third edition. Hooker's 'British Flora,' sixth edition. Lawson's 'Royal Water-Lily.' 'Annals of Natural History.' Hooker's 'Journal of Botany.' 'The Phytologist.' 'Annales des Sciences.' 'Botanische Zeitung.' 'The Flora.'

Miscellanea : Record of Localities. *Epipactis ensifolia* in Gloucestershire. *Cicendia Candollei* (*Grisebach*). Mr. Ball on the genus *Leontodon*. Index to the Records of Localities in the 'Botanical Gazette,' Vol. ii.

Contents of 'Hooker's Journal of Botany,' No. 24, December, 1850.

Report on the "Brown Scale," or *Coccus*, so injurious to the Coffee Plants in Ceylon ; by the late George Gardner.

Letter from M. Berthold Seeman, Naturalist of H. M. S. Herald's Voyage in 1849 and 1850.

Appendix to the 'Spicilegia Gorgonea ;' by P. B. Webb, Esq.

The Origin of the Existing Vegetable Creation ; by J. E. Schouw.

Description and Figure of the Cedron of the Magdalena River ; by Sir W. J. Hooker.

Botanical Information : Botanical Piracy.

Notices of Books : Sullivant's 'Bryology and Hepaticology of North America,' Part 2. Spring's 'Monographie de la Famille des Lycopodiacees.' Cartwell's 'Carices Americæ Septentrionalis exsiccatae.'

On the Locality of Cystopteris montana.

By WILLIAM BORRER, Esq., F.R.S.

I HAVE observed the notice respecting *Cystopteris montana* on the wrapper of the 'Phytologist' for November last. I had the pleasure of gathering the plant in August last, in Breadalbane, not in Mr. Wilson's place in Ben Lawers, which has not, I believe, been rediscovered, but in the range of mountains between Glen Dochart and Glen Lochay, where Messrs. Gourlie and Adamson found it in 1841. From those gentlemen Dr. Arnott obtained a direction to the spot, and kindly accompanied me thither. The station is recorded in the sixth edition of the 'British Flora' under the name of Corrach Uachdar, but a native of the neighbourhood called the mountains Meal Oufillach, and the ravine Corrach Dh' Oufillach, as nearly as I could express his pronunciation. He could not spell the words.

I had the satisfaction also of ascertaining that *Menziesia cærulea* still exists in Drumochter (or Drum Uachdar), on the confines of Atholl and Badenoch, where I saw several tufts of it among the heath and cranberry.

W. BORRER.

Henfield, November 22, 1850.

Botanical Society of London.

(Anniversary Meeting.)

Friday, November 29, 1850. J. E. Gray, Esq., F.R.S., President, in the chair.

Donations of British plants were announced from Mr. Hewett C. Watson, the Rev. W. R. Crotch, Mr. J. Storey, the Rev. R. C. Douglas, Mr. J. D. Salmon, the Rev. W. M. Hind, Mr. D. Stock, Mr. T. Ingall, Mr. J. S. Syme, Dr. Mateer, Dr. Melville, Mr. S. P. Woodward, Mr. G. Rich, Mr. T. Clark, Mrs. Atkins, Mr. A. Henfrey, Mr. J. H. Wilson, the Rev. H. P. Marsham, Miss Wilson, Mr. G. S. Gibson, Mr. T. Sansom, Mr. J. Buckman, Mr. Brent, Mr. Bean, Dr. Dickinson, Mr. J. Reynolds, Mr. J. L. Lawrence, Mr. W. C. Unwins, Mr. J. A. Brewer, Mr. W. L. Notcutt, Mr. D. Oliver, Jun., Mr. J. Lynham, Mr. G. Maw, Mr. T. Moore, Mr. G. C. Churchill, Mr. Dutton, Mr. T. C. Heysham, and Mr. E. G. Varenne.

Mr. G. E. Dennes, Secretary, read the Report of the Council, from which it appeared that thirteen new members had been elected since the last anniversary, the Society now including two hundred and fifty-five members. The distributions of British and foreign plants had been carried on regularly and numerous, and many valuable parcels had been received recently, as the result of exertions made by members during the past summer. The Council had requested Mr. Hewett C. Watson and the Secretary to prepare a third edition of the 'London Catalogue of British Plants,' a copy of which, in proof, was laid on the table. The Report was unanimously adopted, after which a ballot took place for the Council, when the chairman was re-elected, and he nominated J. Miers, Esq., F.R.S., and A. Henfrey, Esq., F.L.S., Vice-Presidents. Mr. R. Hudson, F.R.S., Dr. Mateer, and Dr. Palmer were elected new members of the Council. Mr. J. Reynolds, Mr. G. E. Dennes, and Mr. T. Moore were re-elected Treasurer, Secretary and Librarian.

Mr. A. Henfrey, V.P., read a brief report on the progress of botany and botanical literature during the year 1850, to the following effect. "The present year has not been signalized by any remarkable discovery, in publication, in the department of physiological botany. Many interesting papers have appeared on various subjects in the journals, contributing to increase our knowledge of development, and of the characters of the elementary structures; but the phenomena of cell-formation still presents a wide field for investigation. The third German edition of Schleiden's 'Principles of Scientific Botany' has been completed, and offers one point worthy of note, namely, the author's continued assertion of the truth of his original view of fertilization in the phanerogamia, in opposition to almost all recent observers. A new edition of Dr. Asa Gray's useful 'Manual' has also been published. In the department of systematic botany much more activity has been displayed, so far as publication is a criterion. In addition to the numerous fragmentary notices in the botanical journals, many important separate works have appeared. A fifth volume of Kunth's 'Enumeratio Plantarum' has made its appearance since his death. Prof. Unger has published a synopsis of all known fossil plants. Mr. Woods has brought out the European Flora, on which he has been so long engaged. Several local European floras have been presented to the world, among which may be noticed Meyer's 'Flora of Hanover,' the completion of Fries's 'Summa Vegetabilium,' and the commencement of a new illustrated work, called 'Plantæ Scandinaviæ,' by Mr. Anderson. Of new editions we have

one almost constituting a new work in the sixth edition of Hooker's 'British Flora,' by Dr. Arnott, a most valuable contribution to British botany; and a second illustrated edition of Prof. Harvey's excellent 'Manual of British Algæ.' Numerous other works of less general importance have contributed to swell the list. Botanists have to lament the death of many active followers of the science during the last twelve months: Prof. Kunth, of Berlin; Dr. Corda; Prof. Raffeman Delile, of Nancy; Dr. Dietrich, well known by his horticultural works; together with Profs. Moritzzi, George Hecker, and Drs. Berger, Hagenbach and Martius, the father of Prof. Martius. We have more particularly to deplore the loss of a young and zealous aspirant for botanical honours, Mr. J. H. Wilson, whose awfully sudden death came like a thunder clap on those who saw him, full of life and apparent health, at our last monthly meeting."—*G. E. D.*

A Catalogue of the Plants growing wild in Hampshire, with occasional Notes and Observations on some of the more remarkable Species. By WILLIAM ARNOLD BROMFIELD, M.D., F.L.S., &c.

(Concluded from Phytol. iii. 1019).

Elymus europæus should be looked for on the sandy parts of the Hampshire coast; it is not a frequent production in the south of England, but is stated to occur in Dorsetshire by Pulteney, on his own authority (Cat. of the more rare Plants of Dorset. p. 68). The Isle of Wight certainly does not afford this valuable grass.

Hordeum sylvaticum (*Elymus europæus*, L.). In woods, copses and thickets, on a calcareous soil; rare. Picked* very sparingly (only three specimens seen) in a beech-wood at the south-west end of Hambledon, facing Berry Lodge, called, I was told, Butler's Copse, Aug. 6, 1850. In this and the two following stations the species is associated with *Triticum caninum*. In Akender Wood, near Alton, Rev. G. E. Smith, 1840 !!! where I find it in considerable quantity, but growing in a very scattered manner, chiefly near the margin of the wood at the entrance from the Alton side. Chawton Park, near

* I use the term "picked" throughout this Catalogue, as a concise and convenient expression, to imply that a single, or at most a very few, specimens of any plant have been seen and collected in a given locality.

Alton, Mr. J. Woods, jun., in old Bot. Guide. I did not remark it there myself on repeated visits to Chawton; perhaps the last station may be that intended, for Akender Wood adjoins on Chawton Park, and probably forms part of Mr. Knight's estate. In a thick hedgerow on the north side of the lane about three hundred yards east of Nettlebed, near Old Alresford, Mr. J. Forder, June 22, 1850 !!!—the plant grows here very sparingly, as does its associate, the *Triticum caninum*. I think Mr. F. said the *Hordeum* occurred in other places near Alton. In the woods a mile west of Petersfield, Merrett, Pin. p. 57. Besides its other characters, this species is at once known from our remaining Barley grasses, by the fusiform and cylindrical, not flattened or distichous, spike.

Hordeum pratense. Abundant in dry, as well as damp, meadows and pastures over most parts of the county and Isle of Wight, sometimes also in salt-marshes, with *H. maritimum*. About Ryde it too often constitutes an undue proportion of the hay crop,* as it does in the salt-marsh meadows near Yarmouth, Thorley, Newtown, Cowes, &c. Salt-marsh shores of Langston Harbour. Spikes elongate or lance-oblong; culms leafless above; sheaths close. The lateral florets of *H. pratense* I find usually bear stamens with apparently perfect anthers, the pistillate organs alone imperfect or wanting.

Hordeum murinum. By way-sides, on and under walls, in dry, waste places, and borders of fields, especially about towns and villages; plentiful almost everywhere. Spikes obovate, oblong or sub-cuneate; culms mostly leafy at top.

Hordeum maritimum. On salt-marshes, banks and pastures near the sea; profusely on most low parts along the coasts of the Isle of Wight and mainland Hants. In the marsh-meadows by Springfield, near Ryde. On the embankment by Yarmouth Mill, and at Norton. Abundant in salt-marsh meadows at Newtown, &c. It often constitutes nearly the sole herbage in our flat, saline pastures, and on the site of abandoned salt-works, as in Hayling and Portsea Islands, shores of Langston Harbour, Porchester, about Lymington, Exbury, &c. Spikes ovate-oblong; culms leafy above; sheaths loose. A worthless little species.

Nardus stricta. On hilly, heathy and moory ground, but either

† As in the Monckton meadows, close to St. John's old turnpike-gate, in which the herbage consists mainly of the "Squirrel-tail grass," which looks fair enough to the eye before coming into flower, with promise of good yield, but when ripe for mowing the bearded florets injure the hay, since they are apt to annoy the cattle that eat it by sticking in their teeth and gums.

really uncommon, or, what is more likely, passed unnoticed by me in the Isle of Wight. Plentifully on the northern side of Headon Hill, overlooking Tetland Bay, June, 1841. Pointed out to me at the foot of Bleak Down by Mr. Wm. Wilson Saunders, July, 1841. Pastures near Rookley Farm, 1842, and in moist pastures close to the Wilderness, June 17, 1844. It has not fallen in my way on mainland Hants, where there is every reason to suppose it cannot be very unfrequent. Titchfield Common, Mr. W. L. Notcutt.

Lepturus incurvatus (Rotboellia incurvata, L.). In salt-marsh meadows and pastures, and along the grassy borders of creeks and inlets of the sea and tide-rivers; not unfrequently. Var. β ., Spikes very slender, scarcely curved (L. filiformis), is connected with the stouter, more incurved form by so many intermediate gradations, that in practice they can with difficulty be made subjects of reference. Near Ryde, but rarely. Meadow between Quarr Abbey and the sea. St. Helen's, 1840, and in a little creek by Carpenter's. At Springfield, on the waste ground in front of the houses near what was till lately the Vernon Hotel, also in salt-marsh meadows between Springfield and Sea View, July, 1843. Between Yarmouth and Freshwater. Amongst short grass near the shore at Norton, just opposite to where the road to Freshwater goes off from the beach. The foregoing stations refer to the var. β ., or forms inclining to it rather than to α .; the following belong to the latter, stouter and more incurved state of the species. Extremely luxuriant and abundant in flat salt-marsh meadows by Newtown, growing in great, spreading tufts, 1842. With short, thick, strongly incurved culms, and cespitose growth, in cultivated fields above Freshwater Bay, a short distance from the hotel (Groves's), on the ascent of the down towards the Needles, in great plenty, where it was pointed out to me some years ago by the Rev. G. E. Smith, who supposes it must have been conveyed with seaweed, for manure, to this odd situation. Thorness Bay, Rev. Wm. H. Coleman, 1842 !!! By the Medina, near Dallimore's Farm, in plenty (a stouter form of β .), and along the shore between W. Cowes and Egypt, Miss G. E. Kilderbee !!! Here and there in many other parts of the island. Not rare along the opposite coast. Shores of Langston Harbour. I have noticed it in West Hants, I think at Lymington, and in the Beaulieu River, but I have not been at much pains to note down stations for a species so frequent as this. Wicor Hard; the Salterns (Fareham), Mr. W. L. Notcutt.

A singular grass, bearing some resemblance, when in full flower, to *Lolium perenne*, and delighting to grow amongst the herbage skirting

the little creeks or inlets of salt-water rivers, where its unopened spikes are not readily distinguishable from the leaves or barren scapes of some of the smaller Junci, even after the white anthers have begun to protrude, looking as if accidentally blown upon and adhering to the supposed rushes. In such situations the plant has a very slender habit, the culms being hardly thicker than ordinary packthread or whipcord, when it is our var. β ., but in proportion as the situation is more open and exposed, the grass assumes a stouter, shorter, more rigid appearance; the spikes are then remarkably incurved, and sometimes nearly as thick as an ordinary quill; it is then our var. α ., found in flat, open salt-marsh ground.

Equisetum arvense. Abundant everywhere in wet, clayey or gravelly soil. A troublesome plant in damp corn-fields. Plentiful on the banks of wet, slipped land along the Hampshire coast.

Equisetum Telmateia (E. fluviatile, Sm., non Linn.?). In marshy or boggy and shady places, wet thickets, hollows, by river-sides, &c.; frequent over the Isle of Wight and rest of the county. The authors of the sixth edition of the 'British Flora' are of opinion that the name fluviatile should be retained, on the ground that it was imposed by Linneus to designate a collective species, made up of the present plant, and one of the forms or varieties of his E. limosum; but is not this a reason for rejecting the prior name of fluviatile, rather than for adopting it? For it is plain, from its occurrence in his 'Flora Suecica,' that Linneus meant to describe under the title of E. fluviatile a species *native* to Sweden, which Wahlenberg distinctly tells us our great Water Horsetail, the E. Telmateia of Ehrhart, is not.* Now, as in a collective species, one only of the names belonging to the *duo* or *trio* of plants composing it can be adopted, it seems most fitting and natural to retain the name of that constituent which the founder of the collective species had in view as the best representative of such species, and since in this case the type has been subsequently shown to be a form or variety of another and recognized species (Linneus's own E. limosum), it seems advisable to abandon the name fluviatile altogether, and adopt a new one, to obviate all chance of confusion in time to come, and for this purpose Ehrhart's name is significant and appropriate; its Hellenic construction, though somewhat *hors de regle* applied to a species, is no very weighty objection, and has many a precedent in its favour.

* Itaque nostra planta longe distat ab illo, præsertim Hollandico E. Telmateia, Ehrh., E. fluviatili, Anglor. in Suecia non observato. (Wahlenb. Fl. Succ. edit. altera, ii. p. 714).

Equisetum sylvaticum. In boggy woods and thickets, and by stream-sides, in wet, shady situations; very rare. In the withy-bed at the lower part of Apse Heath, in very great abundance. In the Parsonage Lynch, Newchurch. These are the only stations I am acquainted with for this slender and graceful species in Hampshire, on the mainland part of which it most likely exists, but is an uncommon plant in the south of England generally.

Equisetum limosum. Frequent in shallow, slow or stagnant water, as ditches, ponds, &c. with a muddy bottom. In the marsh-ditches of Sandown Level, &c., abundantly, as also in the moors at Moor Town, Brixton, along with *E. palustre*. In a small pool on the south side of Cothey Bottom Copse,* between Westridge House and Barnsley Farm. Plentiful, if I mistake not, as I speak from memory only, in marsh-ditches at Brading and behind Gurnet Bay, and common, I think, in most parts of the county. By Titchfield River, Mr. W. L. Notcutt.

Equisetum palustre. In marshy or boggy places, on wet, gravelly or sandy banks, turf-moors, &c. Less frequent than *E. limosum*. Plentiful, with the last, in wet meadows about Brixton, at Moor Town, &c. Abundant in the moist meadows at Easton, Freshwater Gate. Shanklin Chine, in plenty. Var. β . *proliferum*. With α . in several of the foregoing stations, as about Shanklin Chine. In old gravel-pits just beyond the bog at Cockleton. Bog at Cockleton, in abundance, Miss G. E. Kilderbee; also between Debborn turnpike and Gurnet Farm, by the side of the road, *Ead.!!!* I do not happen to have noticed this species on mainland Hants.

Equisetum hyemale, more frequent in the north than the south of England, should be looked for in our wet woods.

Polypodium vulgare. On damp rocks, walls, trunks of trees, and shady hedge-banks; abundant throughout the county and Isle of Wight. Var. β . Lower pinnæ of the frond forked. Steephill, Mr. Albert Hambrough! Var. γ . Fronds doubly pinnatifid. On a rock at Bonchurch, 1845, *Id.!* This remarkable form of the common Polypody resembles pretty closely that given in Newman's 'British Ferns,' fig. g. p. 113, but in this the secondary segments or pinnules are broader, and divided close down upon the midrib. My specimen, from Mr. Hambrough, as is usually the case in the variety called *P. cambricum* by Linnaeus, is destitute of fructification.

[*Polypodium Dryopteris*.] When visiting, this summer, the beautiful gardens and collection of choice exotics at Leigh Park, the seat

* Cothey ground; wet, boggy or springy ground in Hampshire vernacular.

of Sir G. Staunton, Bart., near Havent, in company with Dr. Salter and Professor Meisner, of Bâle, Mr. Scott, the very able and most obliging gardener, showed us numerous plants of this species, which he said invariably comes up abundantly in peat-mould, which he is in the habit of obtaining at different times from Petersfield Heath. As the natural stations for this Polypody are shady, damp places or mountains, its occurrence on so open, level and marshy a locality as Petersfield Heath is an anomaly, compelling us to hesitate before we receive it into the catalogue of Hampshire ferns, even on the strength of numberless undoubted living specimens. I have often traversed that heath in all directions, and explored its botanical productions, without seeing anything resembling the Oak-fern, which nevertheless is not, I should say, unlikely to occur in the high woods near Petersfield, on the wet sandstone rocks, where *P. Phegopteris* should also be looked for, the two species having nearly the same geographical distribution, and affecting very similar places of growth.

Lastrea Thelypteris. In boggy meadows and thickets; rare. In various places in the Isle of Wight, mostly in West Medina or the confines of the eastern hundred. In several meadows in the marsh at Easton, Freshwater Gate, in great plenty, on deep bog-soil, composed, as it appears to me, chiefly of comminuted shells, but not fructifying freely, and where, Miss G. E. Kilderbee tells me, it is called Ground Fern by the country people. In a large willow-bed between Compton and Dunsbury Farms, a little north-east of Compton Grange, Sept. 24, 1844. In the valley of the Medina. Abundant and very luxuriant on the Wilderness, amongst a perfect jungle of low willows and Sweet Gale, also between that place and Rookley, and found by my friend R. Godman Kirkpatrick, Esq., Sept. 1840, tolerably plentiful in a boggy meadow by Cridmore, very large and luxuriant, some of the fronds being upwards of fifteen inches long, and in fine fructification!! Less plentiful in East Medina. Boggy meadow a little above Alverstton Mill, rather sparingly. In very small quantity on a ditch-bank between Merry Garden and Ninham (near Shanklin). On a piece of boggy land under a high bank above Knighton Lower Mill, opposite Knighton Farm, between that and Hartsash, the sterile fronds rising May 6, 1845. Portsea Island, Mr. L. H. Jacob! I am unacquainted with any other station than this for the Marsh Fern across the Solent; stations for it probably exist the bogs of the forest districts

Lastrea Oreopteris. In elevated, boggy and heathy places; extremely rare in the Isle of Wight. Found in extremely small quantity (I think only a tuft or two) at Apse Castle, October, 1843, by Dr. T.

Bell Salter, who has not been able to rediscover it for this year or two past, owing, he supposes, to the draining which has been carried on there, making the ground too dry for its existence. He thinks it probable that the species was once much more frequent, perhaps even abundant, at Apse Castle, before the grass-walks were cut through the wood, and the locality was moister and more shady than at present. On a low, wet bank by the road-side between Guildford and Lynn Farm, sparingly, Sept. 17, 1843, *Id.*!! The Wilderness? Mr. Albert Hambrough, 1846, but I cannot find it there, and I suspect *L. Thelypteris* was inadvertently mistaken for it, as I have seen no specimens from thence. It certainly occurs in the New Forest, as I have myself gathered it there on an excursion with Dr. Salter into Dorsetshire, about eight years ago; the locality has escape me, but I think it was somewhere near Lyndhurst. Near Southampton, Mr. Lambert in old Bot. Guide. Very likely not unfrequent on boggy heaths in the recesses of the New Forest, a most interesting tract, that has been very little explored botanically.

Lastrea Filix-mas. In moist, shady woods, thickets and hedges; very frequent over the greater part of the county and Isle of Wight. Growing in beautiful tufts in the park at Swainston.

L. cristata may possibly be found hereafter in a county abounding so much in bog and marsh as do many parts of Hampshire.

Lastrea spinulosa. In damp hedge-bottoms, and on shady banks, in woods and lanes, &c.; frequent in the Isle of Wight, and I believe throughout the county. Abundant on the Wilderness. In the dell at Apse Castle, called Tinker's Hole, in plenty.

Lastrea dilatata. In similar places with the last; not, I think, unfrequent, although not now prepared to give its distribution in the county. Near Ninham Farm, by Ryde, &c. Is it distinct from *L. spinulosa*?

L. fœnisecii, which, under the title of *L. recurva*, has caused a vast deal of ink shed, to little or no purpose, may be a native of the county. The specific name of the species is not very intelligible in connexion with a fern, a tribe of plants seldom found in the way of the mower's scythe in the hay-field.

Polystichum aculeatum. Very common on hedge-banks, in lanes and borders of woods, &c., in the Isle of Wight, and probably throughout the county.

Polystichum lobatum. In like places with the last, of which it is probably merely a form, but the British species of the genus are inextricably confused, and I confess to having paid them hitherto

very little attention on that account. Extremely rare in the Isle of Wight. A single root on a bank close to Coopers, near Bembridge, Dr. T. Bell Salter, 1841—1842 !!! Bank on the left-hand side of the road going from the lodge at East-Cowes Castle towards Whippingham, Miss G. E. Kilberbee ! The specimen from Cowes, in Miss Kilderbee's herbarium, Dr. Salter considers a lonchitidiform variety of *P. angulare*, but the frond, which exhibits no fructification, has the narrow, lanceolate outline and attenuated base that distinguish *P. lobatum* ; the basal pair of pinnules, too, of each pinna is very unequal, and the pinnules themselves decurrent almost throughout, a very few of the inferior ones on the lowermost pinnæ only being as distinctly petiolate as in the true *P. angulare*. The plant appears, besides, to possess the rigidity of texture characteristic of the genuine *P. lobatum*. Common in the shady lanes about Selborne, Dr. T. Bell Salter !!!

Polystichum angulare. In similar places with the four preceding ; abundant throughout the island, and I believe the rest of the county. Stubbington ; Uplands ; Cattisfield, &c. : Mr. W. L. Notcutt.

Cystopteris fragilis, there can be scarcely a doubt, will some day be found in Hampshire ; it should be looked for on old walls, buildings and rocks.

Athyrium Filix-fœmina (*Asplenium Filix-fœmina*). On moist rocks, and in wet, boggy or heathy places ; very frequent in various parts of the Isle of Wight and mainland Hants. Very abundantly on damp hedge-banks on the skirts of Blackpan Common and parts adjacent. In the boggy valley of the Medina, by the Wilderness, &c. Very fine in a little damp lane at Whitwell, not far from the church. Very luxuriant in Shanklin Chine, Rev. G. E. Smith !!! Common on boggy heaths and by streams in the New Forest. Titchfield Common, Mr. W. L. Notcutt.

Asplenium Adiantum-nigrum. On moist walls, rocks, and especially on shady hedge-banks ; frequent in most parts of the county and island. Near Ninham and Smallbrook Farms. Edge of Quarr Copse, along the Newport Road. Very abundant in the lane leading from Kite Hill into Firestone Copse, and between Upton House and Upton Farm, on the hedge-bank nearly opposite the former, as also in various other places about Ryde, common. Bordwood Heath and hedge-banks about Godshill, plentifully. About Southampton, and in most parts of Hampshire, I have remarked it of frequent occurrence on hedge-banks, its most usual situation with us.

Asplenium Trichomanes. On walls, rocks, ruins, churches, dry

banks and hedge-bottoms; no uncommon species in the county and island, but much less frequent than the preceding, at least in the latter. On the walls of Quarr Abbey, in some plenty on the south-east side, and on those of Carisbrooke Castle, particularly in a small court or quadrangle, which is covered with it. On chalk near the foot of Messley or Mersley Down, just where the road turns off to Newchurch and Knighton, on a bank, sparingly. Plentiful in a lane facing the 'Sun' public-house, at Chale. I have remarked it repeatedly on mainland Hants, where it is certainly no rarity, if it cannot be called common; but having omitted to specify the localities in my notes, I prefer passing them in silence to quoting from memory only.

A. lanceolatum should be found in this county.

Asplenium marinum. In rocky caverns, and in holes and clefts of rocks, along the sea-coast; extremely rare in Hants, and only known to me in the single subjoined station, where it is both excessively sparing in quantity and of most diminutive growth. Amongst masses of rock above the shore west of St. Catharine's Point, beyond Knowle, towards Blackgang, Sept. 12, 1845, Miss Kirkpatrick!!! A careful search in the fissures of the rocks that bound the Undercliff may discover the Sea Spleenwort in new localities and increased quantity.

Asplenium Ruta-muraria. On walls, churches and rocks, in several parts of the county and Isle of Wight, but by no means frequent, at least in the latter. Wall in the Spencer Road, at Ryde, in tolerable plenty, Oct. 27, 1847. On an old brick wall at East Cowes, abundantly. On Arreton, Calbourne and Freshwater Churches. On rocks at Niton, Mr. G. Kirkpatrick. Andover, Mr. Wm. Whale. Bridgefoot (Fareham), Mr. W. L. Notcutt. Doubtless in very many other places when sought for.

Scolopendrium vulgare. In moist, shady woods and groves, on hedge-banks, walls, rocks and ruins, in caves and wells, &c; abundant in nearly all parts of the county and Isle of Wight. Profusely and extremely luxuriant in the Undercliff, to the perennial verdure of which it largely contributes. Var. β . Fronds bi- or tripartite at their extremities. By the road-side from Bonchurch to St. Boniface, near Dyer's Cottage, the late Sam. Hailstone, Jun., Esq.! Var. γ . *undulatum*. Fronds crisped at the margins. Place House (Fareham), Mr. W. L. Notcutt. The fresh leaves of Hart's-tongue are employed externally by rustic practitioners in this island to "bad legs," as a cooling application.

Ceterach officinarum. On old walls, rocks and buildings, but not common in the county on either side of the Solent. On Brading

Church, chiefly on the south porch, in plenty, May 19, 1838 (still there, but in less quantity than before the tiling was renewed a few years back). On a low wall at Coopers, near Bembridge, abundantly, Dr. T. Bell Salter !!!—the wall, I believe, is now razed or rebuilt, and the fern destroyed. Walls of Carisbrook Castle, Mr. G. Kirkpatrick !!! On an old brick wall on the left-hand just out of Botley, on the road to Titchfield, in plenty, June 20, 1848. On the walls of Winton, plentifully. Tower of Old Alresford Church, Mr. Wm. Pamplin in litt. Fareham churchyard, Mr. W. L. Notcutt. Very abundant on a wall by the road-side just beyond Greatham Church, coming from Lyss, four miles from Selborne, Aug. 27, 1849, Dr. T. Bell Salter !!! Netley Abbey, Mr. T. B. Flower !!! New Forest, *Id.* (Newman's Brit. Ferns).

Blechnum boreale. In damp woods, on moist, shady hedge-banks, and wet, heathy or boggy and moory ground; frequent in the county generally, but less so in this island portion of it than on the mainland. In a boggy thicket just at the back of the fruit-garden, St. John's. On the skirts of Lake and Blackpan Commons, near Landguard Farm, plentifully. Sparingly in the lane between Guildford and Lynn Farms, near Haven Street. In the dell, &c., at Apse Castle, abundantly. In and about the Wilderness, and on the moors north of Godshill, in various places. On Kingston moors, between Corve and Kingston, &c. Dripping well on St. George's Down, by Newport, Mr. G. Kirkpatrick! Near Southton, in the New Forest, and most other parts of Hants, frequent, except in the chalk districts, where it is rare, if not quite wanting.

Pteris aquilina. A most abundant and (excepting on the chalk) universal fern all over the county and Isle of Wight, in woods and thickets, on open, rough pasture-land, heaths and commons, whether damp or dry.

Hymenophyllum tunbridgense has been announced to me by a lady as growing amongst moss, at the roots of bushes, near the old walls of Quarr Abbey, on the south side, but the locality is an unlikely one, and there is every reason to believe that some moss resembling it was gathered for the *Hymenophyllum* in this locality. The species, however, is one not at all unlikely to be found on our damp sandstone rocks eventually.

Osmunda regalis. In low, swampy, boggy places, wet meadows, thickets, and on moory, peaty commons, &c. Frequent in various parts of the Isle of Wight, as on the skirts of Lake and Blackpan Commons, and the adjacent parts of Sandown Level. In wet

thickets above Alverston Mill, and in Alverston Lynch, common. Very plentiful and luxuriant in boggy meadows along the Medina, near its source, at Cridmore, Rookley, &c., growing in fine tufts along the ditch that skirts the Wilderness, on the Rookley side. The moors, Brixton. About Godshill; profusely in a large, swampy wood, chiefly of sallows, close to the village, on the north-east, called, I believe, Moor Withy-bed, and in great profusion on the peat-bog just beyond Munsley Hill, about half a mile north of the church (in large tufts), as well as in various places between Godshill and Budbridge, on moist fences and ditch-banks. On Kingston moors, between Kingston and Corve, &c. Moist hedges by Sibbecks, near Niton. Boggy places near Westover, Calbourne Mill, &c., occasionally. Marsh at Easton, Freshwater Gate, sparingly (now perhaps destroyed). Not unfrequent on slipped land west of Blackgang. Wet thicket at Wolverton, by Shorwell. In Sandown Bay (on the slipped cliffs), sparingly, Miss Lucas and the Rev. G. E. Smith!!! Frequent in many parts of mainland Hants. In boggy ground near the Grange Farm, Alverstoke. Margins of the bog at the entrance on Titchfield Common, on the town side of that immense waste. Quite frequent in West Hants, in the New Forest and adjoining hundreds. Bogs and damp heaths near Ringwood, in some places observed of truly regal dimensions, such as I have never seen surpassed, excepting in the west of Ireland, and hardly even there. By the road-side from Ringwood to St. Leonard's, a little before coming to the Malmesbury Arms, in plenty. Bisterne, Miss G. E. Kilderbee. Parley Heath, Mr. J. Curtis in litt. and Brit. Entom. xv. t. 704 (ex loco). Bere Forest, New Forest, Rev. Messrs. Garnier and Poulter in Hamp. Repos. Doubtless in a vast number of other stations, as I have gathered it in several, not mentioned above, myself. Not remarked by me in North Hants, nor communicated to me from thence by others, but the greater part of that section of the county is on the cretaceous system, and I think the *Osmunda*, like most of our other ferns, avoid the chalk.

Botrychium Lunaria. In dry, hilly meadows and pastures, and on open, heathy ground, very rarely in rocky thickets and shady or low and damp situations. In rocky, wooded ground under the cliff at East End, by Luccombe, a little beyond Rose-Cliff Cottage, as you go by the pathway to Bonchurch, on the right-hand, in the shadiest recesses, amongst dead leaves, June 12, 1841, in moderate quantity. Gathered there since by myself, but the place is difficult to find by strangers: the fern grows in narrow hollows between the masses of rock overhung by the brushwood. Near Nunwell, Mr.

John Laurence. In a damp meadow nearly facing Cliff Farm, by Shanklin, in some plenty, Miss E. Sibley, June 2, 1848 !!! Pasture-field near Nunwell Farm, in which there is a pond, but sparingly seen, Dr. T. Bell Salter, May 13, 1849 !!! Two or three specimens picked on the Nythe, a piece of low, moory ground on the north side of Alresford great pond, May 27, 1850. Between East Meon and Clanfield, Mr. Wm. Pamplin in litt. Drier parts of the bog on Titchborne Common, *Id.* Near Hinton House (H. Ampner). New Alresford, Miss L. Legge !!! In meadows at Somborne (near Winton), Dr. A. D. White. These are the only Hampshire stations I know of for a fern which is probably far from rare in the county, but from its colour, size and places of growth, is more easily passed over unheeded than most of its fellows.

Ophioglossum vulgatum. In dampish meadows and pastures; not common, but much more so than the last. Pasture-field between Appuldurcombe and Godshill, April, 1843. Damp, clayey meadow between Pigsley and Smallbrook-Heath Copses, May 16, 1849. Meadow at the foot of Bembridge Down, in considerable abundance, May, 1846, Dr. T. Bell Salter !!! Pasture-field near Nunwell Farm, near a pond in the lower part of the field, in good quantity, *Id.*, May, 1849 !!! Near Blackgang Chine, Mr. Albert Hambrough, 1847 ! (apparently very fine specimens). Near Forringford House, to the north-west, and at Easton Marsh, Freshwater, *Id.*, 1849. Abundant in several meadows between Thorley and Wilmingham Farms, the Rev. James Penfold, June 7, 1838 !!! Pasture-ground by Parkburst Forest, near Mark's Corner, also in Northwood Park, West Cowes, in great plenty, Miss G. E. Kilderbee ! Rough pasture between North Fairlee and Mount Misery, by Newport, Mr. George Kirkpatrick, June, 1841. About equally frequent, probably, on mainland Hants, but my opportunities for seeing it there have been more limited than in this island. In Strathfieldsaye Park, a few specimens, June 20, 1849. Picked very sparingly on Stoke Common, between Itchenstoke and Alresford, May 27, 1850. Meadows at Wonston and Hunston, Rev. D. Cockerton.

Pilularia globulifera. About the shallow margins of pools and meres that are partially dried in summer. Not found hitherto in the Isle of Wight, and apparently quite rare in the county. On the Holt, in the Lodge Pond, Mr. W. O. Newnham. Round some ponds in the Holt Forest, most abundantly, Mr. W. W. Reeves; gathered there with him in May last. At Lymington, Pulteney (Cat. of the Rarer Plants of Dorset). On Southampton Common, Mr. Borrer.

Why should not *Salvinia natans* and *Marsilea quadrifolia* be found in England? the former ranging as far north as Holstein, the latter into the north of France.

Of the following genus, *Lycopodium*, which closes our Catalogue of Hampshire plants for the present, the Isle of Wight seems to possess no representative; I, however, fully expect that *L. inundatum* will turn up on some of our larger heaths and moors, if not the two remaining Hampshire species.

Lycopodium clavatum. On heaths and moors; rare? On heaths in the Holt, Mr. W. W. Reeves in litt. With the two next, *passim*, especially by Cæsar's Camp (near Farnham), Mr. W. O. Newnham in litt. Cæsar's Camp is on the very boundary-line between the two counties, and hence much of the plant may be on the Surrey side, beyond our limits. This species has not occurred to myself in any part of the county.

Lycopodium Selago. On hilly heaths and moors. On heaths near Aldershot, and especially by the canal (Basingstoke), drawing a line from Cæsar's Camp N.N.W., very fine, Mr. W. O. Newnham in litt.!!!

Lycopodium inundatum. On damp spots on heaths where water stands during winter, and in places from which the turf has been pared off; not unfrequent in many parts of the county. On Titchfield Common, observed abundantly in two places, June 18, 1849. On Beaulieu Heath, in a damp place close to the road between Hill Top, or Beaulieu Gate, and Iper's Bridge,* but much nearer to the former, in great plenty, Aug. 29, 1850. Common on the heaths near Christchurch and Bournemouth, Mr. James Hussey in litt. Bog near Titchborne Church (Titchborne Common), and at Oakhanger, Mr. Wm. Pamplin in litt. On peat-bog on Short Heath, near Selborne, Dr. T. Bell Salter!!! With the two foregoing, by Cæsar's Camp, near Farnham, Mr. W. O. Newnham. In wet ground below or south of Shidfield Church, Miss Hawkins.

W. A. BROMFIELD.

Eastmount, Ryde, Isle of Wight.

* Pronounced Eper's Bridge, a unique instance, I should think, of deviation from the usual sounding of the i in English, and adoption of the one given it in all other European tongues. Perhaps some German may have given his name to the place, Iper being one of the words for an elm in that language, and so both the foreign orthography and pronunciation have been retained.

Note on Lastrea uliginosa. By MR. JOHN LLOYD.

HAVING read the Rev. Mr. Bree's observations on this plant in the November number of the 'Phytologist' (Phytol. iii. 1087), and not feeling disposed to acquiesce in that gentleman's conclusions, I beg to offer the following remarks to the notice of the readers of the 'Phytologist.'

In the month of March, 1846, I brought some plants of *Lastrea cristata* from Oxton Bogs. I planted them in a north border, and when they expanded their fronds I observed mixed with them one plant of *Lastrea spinosa*, and several plants which I could not identify with either species, as they appeared intermediate between both. These I cultivated with care, and increased as much as possible for three years, during which time they kept themselves quite distinct. I then sought for further information where I thought myself most likely to obtain it. The result is published in the 'Phytologist' for October, 1849, and also a most clear and correct description of the plant, by Mr. Newman. Since then I have had another year's experience in its cultivation, and the opinion that I first formed I still adhere to; that is, that it is exactly intermediate between *L. cristata* and *L. spinosa*.

As an humble individual my opinion is of little weight, but as the learned of the present day are divided as to what may and what may not be called a species, I am obliged to seek for information in the works of former botanists. Professor Dr. Thomas Martin in his 'Language of Botany,' under the head "Species," defines it as follows:—"The distinct forms of vegetables originally so created, and producing by certain laws of generation others like themselves. There are therefore as many species as there are different invariable forms of vegetables now existing." Now as *L. uliginosa* assumes the same form in Notts, Cheshire, Norfolk and Essex, and Dr. J. T. Mackey is in possession of a plant from Mucross Woods, Killarney, which he has compared with specimens from one of my plants; as any practical gardener who has paid any attention to British ferns will readily distinguish it from all its congeners; and as it has been already discovered in five distinct and distant localities; then if it be not a distinct and invariable plant, I do not know what to call it. It is certainly very near to *L. cristata*, and also to *L. spinosa*, but are not the gradations in all extensive genera (ferns and others) very fine? Instance the overgrown genus *Mesembryanthemum*, which

has several sequences where the plants are so near that it requires a very practised eye to distinguish them apart, and yet they are recorded as species, and suffered to remain so. I wish to state that I fear *L. uliginosa* is eradicated at Oxton, the bog having been inclosed and appropriated as a preserve for wild-fowl. The spot from which I procured the plant in 1846 is now so overgrown with underwood that not only *L. uliginosa*, but also *L. cristata*, has been eradicated. I had the kind permission of Mr. Sherbrook, of Oxton Hall, to examine the bog in June last, but after six hours diligent search I was unable to find a single plant of *L. uliginosa*; I saw plenty of *L. cristata* and *L. spinosa* upon other parts of it; I brought some of each, and shall be most happy to give any gentleman who may be growing *L. uliginosa* a plant of each, that they may be grown by the side of each other.

JOHN LLOYD.

East Hall, Wandsworth,
January 17, 1851.

[It is perhaps worthy of a passing record, that after the publication of my description of this species every series of British ferns exhibited last year in London contained one or more plants of *Lastrea uliginosa*, correctly named, besides the usual *spinosa* and *cristata*, the only others with which it can be confounded. Hence it does appear that whether called a form, variety or species, it is a something which cultivators can recognize.—E. NEWMAN.]

Extracts from the ‘Proceedings of the Linnean Society of London.’

(Continued from Vol. iii. p. 816).

On the Development of the Spores and Elaters of Marchantia polymorpha. By ARTHUR HENFREY, Esq., F.L.S., &c.

MR. HENFREY commences by referring to the memoirs of M. Mirbel on *Marchantia*, &c., and the accompanying note of Mr. Griffith; to M. Lindenberg’s Monograph of *Riccieæ*; and to the several publications of Bischoff, Von Mhol, Gottsche and Fitt on the development of the spores of various cryptogamic plants. He briefly describes the

development of the little green cellular body found within the pistillidium which becomes the capsule of *Marchantia polymorpha*, and states that from the facts observed and from analogy he is inclined to believe that the young capsule is at first formed of a continuous cellular substance, and that the cells of this tissue become parent-cells, producing new cells within them, which they set free by becoming dissolved, exactly as occurs in the production of the parent-cells of the pollen-grains in the continuous cellular tissue of anthers. M. Mirbel does not appear to have examined the contents of the capsules until this complete separation of the cells had taken place, when he describes them as consisting of minute elongated cells (the young elaters) mingled with small squarish cells (the spores). But Mr. Henfrey found the younger capsules to contain elongated cells alone, and those of two sizes. The whole cavity was filled by such cells apparently radiating from the centre; the narrower cells being interposed between much longer and broader cells of the same form. The former were the young elaters, the latter the parent-cells of the spores.

The young elaters Mr. Henfrey describes as elongated slender tubes attenuated towards each extremity, and filled at first with an almost colourless coagulable protoplasm. After a short time starch globules are seen within them, which might readily be mistaken for the rudiments of the spiral fibre; but the author believes that the accounts given by some writers of the formation of spiral fibre in spiral vessels from rows of minute granules are incorrect, and have arisen from observation of starch granules lying in rows often running obliquely across the tubes. After a greater enlargement in the length than in the diameter of these cells the starch granules and finally the protoplasm disappear, and faint streaks denoting the nascent fibres are at length visible upon the walls. These gradually become more and more distinct, until in the mature elaters they present themselves in the form of strong flattened bands. In *Marchantia* there are two fibres, the ends of which are confluent at the extremities of the tubes in which they are contained; so that more properly speaking there is but one endless fibre twisted upon itself, which may be represented by a piece of string doubled with its ends united, and twisted spirally upon itself. This is evidently the best possible condition of structure for its purpose of acting as a spring. In unrolling, the fibre tears up the membrane of the walls of the tube, which after the elaters have been discharged is often no longer to be detected.

While the elaters are passing through these stages the larger

elongated cells exhibit are very remarkable series of changes, which Mr. Henfrey regards as differing from anything that has yet been observed in analogous structures. They are at first killed, like the elaters, with a delicate colourless protoplasm, in which float exceedingly minute granules, and which is apparently the same substance that occurs in all young cells which increase by self-division. These larger cells soon exhibit transverse streaks of a lighter colour, in consequence of the separation of the protoplasm into a number of distinct portions, and the formation of cross membranes at these places, dividing the tubular cell into a row of cells, all of a square form, except the two terminal ones, which are attenuated towards the free point. The author could not determine whether the septa were formed by gradual growing in of the membrane, nor could he detect at this period a double membrane, which must, however, exist, to admit of the subsequent separation of the contained cell. Vertical septa are often formed in addition, producing a double row of cells within the tube. About the time when the cells separate from each other, their contents undergo a change, which exactly resembles that which occurs in the contents of the parent-cells and special-parent-cells of pollen when the formation of free cells is about to take place in their interior. The mucilaginous matter, or protoplasm, acquires a deep yellow colour, becomes much thicker, and exhibits a quantity of globular bodies which look like drops of oil. Mr. Henfrey gives his reasons for regarding these appearances neither as drops of oil nor as vesicular cavities, but as globular drops of the yellow protoplasm. Such globules are of various sizes and sometimes occupy half the cavity of the cell, but neither before nor after their formation was the author enabled to detect the presence of nuclei.

Soon after the separation of these cells their yellow contents exhibit lighter streaks running across, which denote that they are each about to separate into four portions. When these portions are completely isolated and become coated by their proper membranes, they constitute the spores, and are subsequently set free by the solution of the membrane of the parent-cells. Their contents then again become clear and almost colourless, their membrane becomes thickened and of a bright yellow colour, and finally their cavity becomes filled with globules of pretty regular size. No trace of septa dividing the parent-cells into chambers, such as are met with in the special-parent-cells of the pollen, were observed, even when treated with iodine; and when the parent-cells in which the contents had parted into four portions were ruptured at one place, all the contents passed out and

the membrane remained as a simple sac. In the ripe spore the author could distinguish only a single coat, which grows out into a tube at one point in germination. During this process the entire spore, with its contents, becomes colourless, the yellow colour and the globules disappearing; and after a short time chlorophyll vesicles appear, which, on the application of iodine, are seen to be imbedded in a coagulable, colourless protoplasm.

In conclusion, the author again directs attention to the striking circumstance, that throughout the whole course of development he met with no nuclei; neither did he observe nuclei during the development of the spores of *Sphærocarpus terrestris*, which he had also partially traced. Sometimes the globular bodies, before alluded to as formed in the yellow protoplasm, presented appearances which might be mistaken for nuclei; but careful investigation always led him to believe that these appearances were deceptive; and as he obtained clear and well-defined views of all the various stages with fully sufficient magnifying powers to see nuclei if present, he states that he is compelled to deny their existence here.

Ripe Seeds of Cycadeæ produced without Impregnation.

Dr. Wallich, V.P.L.S., read the following extract of a letter from Prof. Lehmann, dated Hamburgh, 14th December, 1849:—"I write to inform you that a work has just appeared, namely, *Proceedings of the Fifth Meeting of Scandinavian Naturalists held at Copenhagen, 1847. Copenhagen, 1849. 8vo.* There is in it a very remarkable paper by Liebmann, entitled 'A few words concerning the Impregnation of Cycadeæ,' p. 501 *seq.* It appears, according to this paper, that in that family ripe and vegetative fruits may be produced, without the process of impregnation. A female plant in the Botanic Garden at Copenhagen (males do not exist in Europe) produced seeds which have germinated! Liebmann made the same observation in Mexico."

Affinities of the Family of Triuriaceæ. By JOHN MIERS, Esq., F.L.S.

Having concluded the description of these remarkable plants, which he gives in much detail, Mr. Miers proceeds to observe on their affinities. They evidently belong to one common group with

Triuris, which the author originally suggested would form the type of a distinct order (Triuriaceæ), subsequently adopted by Dr. Gardner, under the name of Triuraceæ. He first dismisses without hesitation the hypothesis that they have any relationship to Menispermaceæ or Smilaceæ, as suggested by Dr. Gardner with reference to Hexuris; or to any section of Urticeæ, to which Sciaphila was referred by Dr. Blume, and in which he was followed by Endlicher and Gardner. He commences his investigation by calling particular attention to their habitat as plants destitute of real leaves; composed of little more than cellular tissue; void of green colour, of fibres and of ducts; and furnished with a seed not merely acotyledonous, but without distinct embryo. He refers to Mr. Brown's memoirs on Rafflesia, and to Mr. Griffith's on the plants referred to Rhizanthæ, for instances of inembryonal seeds; and observes that we have no satisfactory evidence of the existence of an embryo, in the ordinary sense of the term, in Burmanniaceæ. He notices also the imperfect condition of the embryo in Cuscuta, in Orobancheæ and in Monotropa; and the striking discrepancy between the well-developed cotyledonous embryo of the leaf-bearing Cactææ and the solid and undivided embryo of the leafless genera of that family. Admitting then, in Triuriaceæ, Burmanniaceæ, Belanophoreæ, &c., the existence of an organ endowed with the function, but wanting the usual structure, of the embryo, he proposes for this organ the name of *protoblastus*, with the view of distinguishing between a *protoblasteous* and a *cotyledonous* embryo. Modifications of the protoblasteous structure may occur; and the author refers to Ceratophyllum and to several genera of Aroideæ (especially Cryptocoryne) as furnishing instances of anomalous forms of embryo, which are best explained by a reference to this view of the subject. He also notices some peculiarities in the structure of the seed of Pistia, which he regards as in some points analogous to that of Sciaphila, although widely different from it in others.

Setting aside then the acotyledonous embryo as a character of primary importance, and regarding it only as an imperfect condition of development, common to all the great divisions of the vegetable kingdom, it is evidently among the Endogens that Triuriaceæ should take their place, and the author concludes that upon the whole the greatest amount of approximate characters leans towards Fluviales.

A letter, dated May 19, 1845, addressed by the President to Admiral Sir Francis Beaufort, for communication to Baron Alexander von Humboldt, on the Origin and Mode of Propagation of the Gulf-weed.

“My dear Captain Beaufort,—I am vexed to have kept Baron Humboldt’s letter so long, and now in returning it, that it should be accompanied by so little satisfactory information on the only one of its queries with which I could have been supposed to deal, namely, that which relates to the origin and mode of propagation of the Gulf-weed.

“On this subject it appears that M. de Humboldt (in his Personal Narrative) first supported the more ancient notion, that the plant, originally fixed, was brought with the stream from the Gulf of Florida, and deposited in what Major Rennell calls the recipient of that stream. More recently, however, Baron Humboldt has adopted the opinion,* also held by several travellers, that the Gulf-weed originates and propagates itself where it is now found. To the adoption of this view it appears that he has been led chiefly by the observations of the late Dr. Meyen, who in the year 1830 passed through a considerable portion of the great band of Gulf-weed, and who ascertained, as he states, from the examination of several thousand specimens, that it was uniformly destitute both of root and fructification; he concludes, therefore, that the plant propagates itself solely by lateral branches: he at the same time denies that it is brought from the Gulf of Florida, as, according to his own observation, it hardly exists in that part of the stream near the great band, though found in extensive masses to the westward. I have here to remark that, as far as relates to the absence of root and fructification, Meyen has only confirmed by actual observation what had been previously stated by several authors, particularly by Mr. Turner (in his ‘*Historia Fucorum*,’ vol. i. p. 103, published in 1808), and Agardh (in his ‘*Species Algarum*,’ p. 6, published in 1820). But Meyen materially weakens his own argument in stating that he considers the Gulf-weed (*Sargassum bacciferum* of Turner and Agardh), and the *Sargassum natans*, or vulgare, specifically distinguished from it by these authors, as one and the same species; adding, that he has observed among the Gulf-weed all the varieties

* Histoire de la Géographie du Nouveau Continent, vol. iii. p. 73, and Meyen, Reise, vol. i. p. 36—9.

of *Sargassum vulgare* described by Agardh; and finally, that on the coast of Brazil he has found what he regards as the Gulf-weed in fructification. Now as *Sargassum natans* has been found fixed by a discoid base or root, in the same manner as the other species of the genus, and as according to Meyen the Gulf-weed has been found in fructification, the legitimate conclusion from his statements seems to be, that this plant is merely modified by the peculiar circumstances in which it has so long been placed. I am not, however, disposed to adopt Dr. Meyen's statement, that he actually found the true *Sargassum natans*, much less all its supposed varieties, mixed with the Gulf-weed, having reason to believe that at the period of his voyage his practical knowledge of marine submersed Algæ was not sufficient to enable him accurately to distinguish species in that tribe. It is not yet known what other species of *Sargassum* are mixed with the Gulf-weed, what proportion they form of the great band, nor in what state, with respect to root or fructification, they are found; though, in reference to the questions under discussion, accurate information on these points would be of considerable importance.

"That some mixture of other species probably exists may be inferred even from Dr. Meyen's statement, and indirectly from that of Lieut. Evans, who, in his communication published in Major Rennell's invaluable work on the Currents of the Atlantic, asserts that he found the Gulf-weed in fructification, which he compares with that of Ferns, a statement which would seem to prove merely that he had found along with the Gulf-weed a species of *Sargassum* with dotted leaves, the real fructification of the genus bearing no resemblance to that of Ferns, though to persons slightly acquainted with the subject the arranged dots on the leaves might readily suggest the comparison.

"With regard to the non-existence of roots in the Gulf-weed as a proof of specific distinction, it is to be observed that the genus *Sargassum*, now consisting of about sixty species, is one of the most natural and most readily distinguished of the family *Fucaceæ*, and that there is no reason to believe that any other species of the genus, even those most nearly related to, and some of which have been confounded with it, are originally destitute of roots; though some of them are not unfrequently found both in the fixed and in considerable masses in the floating state, retaining vitality and probably propagating themselves in the same manner (see Forskal, *Fl. Ægypt.-Arab.* p. 192, n. 52). It is true indeed that a *Sargassum*, in every other respect resembling Gulf-weed, has, I believe, not yet been found furnished either with roots or fructification, neither Sloane's

nor Browne's evidence on this subject being satisfactory.* But the shores of the Gulf of Florida have not yet been sufficiently examined to enable us absolutely to decide that that is not the original source of the plant: and the differences between the Gulf-weed and some other Sargassa, especially *S. natans*, are not such as to prove these two species to be permanently distinct. The most remarkable of these differences consists in the leaves of the Gulf-weed being uniformly destitute of those dots or areolæ so common in the genus *Sargassum*, and which are constantly present in *S. natans*. These dots, in their greatest degree of development, bear a striking resemblance to the perforations or apertures of the imbedded fructification in the genus. But as the receptacles of the fructification, as well as the vesicles, are manifestly metamorphosed leaves; and as the production of fructification is not adapted to the circumstances in which the Gulf-weed is placed, it is not wholly improbable, though this must be regarded as mere hypothesis, that the propagation by lateral branches, continued for ages, may be attended with the entire suppression of these dots.

"That the Gulf-weed of the great band is propagated solely by lateral or axillary ramification, and that in this way it may have extended over the immense space it now occupies, is highly probable, and perhaps may be affirmed absolutely without involving the question of origin, which I consider as still doubtful.

"My conclusion, therefore, is somewhat different from that of Baron Humboldt, to whom I would beg of you to forward these observations, which will prove that I have not been inattentive to his wishes and to your own, though they will at the same time prove that I have had very little original information to communicate."

Notes on the Dry-rot, as observed in the Church of King's Wear, Devonshire. By A. H. HOLDSWORTH, Esq.

The church of King's Wear is immediately opposite to Dartmouth, and stands about 100 feet above the harbour, on the north-west side of a very steep hill, which rises 200 feet above it. The walls of the

"* See Sloane's *Jam.* i. p. 59. I have examined Sloane's specimens in his herbarium; they belong to Gulf-weed in its ordinary form, and are alike destitute of root and fructification; hence they are probably those gathered by him in the Atlantic, and not those which he says grew on the rocks on the shores of Jamaica. Browne's assertion to the same effect is probably merely adopted from Sloane."

old church having become unsafe, the whole of it was taken down except the tower at the north-west angle, to which a new church was attached, standing within the site of the old one, and the new building was completed about two years ago. From the north and south doors eastward the ground rises rapidly, and an area is formed round the church to preserve it from damp; from the same doors to the westward the ground falls far below the level of the floor within. The floor and ground beneath the old church were removed and the graves filled up. The new seats, which were open, rested on oak-sleepers, supported by new dwarf walls, the floors of the seats being about sixteen inches above the ground; but the earth on which the paving of the aisles or passages was laid was as high as, and rested against the sleepers on, the dwarf walls. The other parts of the seats were of Baltic deal. Good limestone masonry was used in the construction of the walls; the pillars and windows were made of stone from France; and the aisles were paved with closely-jointed fine black slate.

Within a few months after the completion of the church a fungus was observed at the seat at the corner immediately behind the south door, and soon after decay appeared in other seats near it. Fresh passages for air were made through the walls running under the seats, but in a few months these were filled with a species of vegetable matter looking like fine mould. This was found to spread under the whole of the seats to the west of the south door, and successively affecting those to the eastward of the same door and those of the centre of the church, but always that part which adjoined the aisle or passage. A suspicion arose, from taking up some of the stones of the aisles, that there was a plant which had its origin near the south door, which crossed under the paving of the aisles, and travelled along the sleepers and framing of the seats, causing all the mischief; and a thorough investigation was determined on. On taking down some of the seats, a fungus was found having some of its branches as large as straws, and others as fine as horse-hair, spreading out under the floors of the seats in the very finest fibres, breaking into forms resembling the finest leather, and wherever it obtained a good supply of air by means of an air-channel, becoming half an inch thick, attached on one side to the dry floor, and having on the other side a spongy surface, fitted for the collection of moisture from the atmosphere; for although the floor was perfectly dry, the fungus by which it was eaten out was as wet and cold as a sponge filled with water. The seat next the south door was

removed; its framing was entirely decayed, and beneath it was found a root-like portion of the fungus descending nearly perpendicularly to the depth of sixteen inches. In the aisle the seats were not affected, and it was presumed that they had not been reached by the fungus; but on taking up the paving-stones of that aisle, it was found to have approached within a foot of the reading-desk, growing from the seats of the opposite side of the aisle in the form of a semi-circle increasing gradually on all sides.

Mr. Holdsworth is convinced that one plant, beginning near the south door, was the cause of all the mischief; when, however, the whole of the paving of the aisles was removed, other plants were found spreading in a fine film under it in a circular form, and six or eight inches in diameter; and these, when carefully taken up, were seen to have a stem in the centre running two inches or more into the ground, and usually attached to a bit of decayed wood. Thus the habit of the plant appears to be to travel on through grooves or under pavements, and in other concealed places, where it can find wood on which to feed, and which it renders dry and of a character as if destroyed by fire. Mr. Holdsworth exhibited dried specimens of the fungus in various states, which he has presented to the British Museum.

Notice of a peculiar Structure of the Cells on the surface of Callitriche verna. By E. LANKESTER, M.D., F.R.S., F.L.S. &c.

The peculiar cells described by Dr. Lankester were found by him, in the summer of 1849, on the stems of a specimen of *Callitriche verna* preserved in a glass vessel with other water plants. They project from the surface of the plants, are of a stellate form, and consist of a central cell surrounded by six or eight others. They are easily detached from the epidermal tissue, and may thus readily be procured for microscopic examination. They vary in size as well as frequency, and are not confined to the stem, but occur also on the leaves; and Dr. Lankester is inclined to believe that they are most abundant in the younger states of the plant. In the first stages of their growth they are to be distinguished from the surrounding cells only by their peculiar arrangement; but as the development proceeds, the epidermal (including these stellate) cells contain a smaller proportion of chlorophyll than those under and above them on either side of the leaf, and become gradually freer from cell-contents, until at

last they appear perfectly clear. In other water plants, such as Lemnæ, Potamogeta, &c., Dr. Lankester had not succeeded in detecting any similar bodies. As regards their function, he states, that it at first occurred to him that they might perform the office of stomata; but he was unable to discover any orifice among the cells, or any communication with intercellular spaces below them. In their structure and general arrangement they bear a closer resemblance to certain modifications of hairs than to any other epidermal organs; and the author considers it not improbable that they are the result of the same tendency of the epidermal tissue under water as that which produces hairs when this tissue is exposed to the influence of the atmosphere.

Notice of the 'Botanical Gazette,' No. 25, January, 1851.

WITH the present number the 'Botanical Gazette' diminishes its quantity of letter-press to fourteen pages, and its price to sixpence. For this change two causes may be assigned as probable: *first*, the great paucity of original communications, reduced in the present number to three quarters of a page from Mr. Babington and half a page from Mr. Buckman; and *secondly*, the announcement of a rival publication at York, which is to contain twenty-four pages royal 8vo, and to be illustrated with numerous engravings, for the small charge of sixpence. The first of these causes has lately pressed more or less heavily on all botanical periodicals, and if the 'Phytologist' has been able to put a better front on the affair, it is mainly indebted for the advantage to the length to which Dr. Bromfield's admirable paper on the Hants flora has extended; and it is by no means certain that the botanical famine which has pressed so severely on other periodicals will not eventually reach the 'Phytologist.' Far be it from me, therefore, to censure a fault all but inevitable, and one which leads me in the present number to make extracts and abstracts to a somewhat unusual extent. With regard to the York publication to which I have alluded, I think we should meet it in the spirit in which it has been projected. For my own part, if the promise is but maintained, "a well-conducted and first-class magazine, containing twenty-four pages and numerous illustrations," supplied for sixpence, I shall certainly rejoice that information is distributed at so easy a rate, and rendered so accessible to all who may possess a taste for the science.

To return to the 'Gazette,' the titles of the papers to which I have alluded are as under.

On the *Cerastium pumilum* of Curtis. By Charles C. Babington, M.A.

On a curious Form of Corolla in *Lamium album*. By J. Buckman, F.G.S., F.L.S., &c., Professor of Geology and Botany, R.A.C.

Mr. Babington observes that the authors of the new edition of the 'British Flora' place Curtis's *Cerastium pumilum* as a probable variety of *triviale*, with which indeed Mr. Babington considers it has much in common. Its habit, its rather long petals, about equal to the calyx, and the tendency of its capsules to curve upwards, are so many similarities to the species in question. "In *C. triviale* the fruit-stalks are not reflexed from their base, as is the case in *C. pumilum*, but are erect or ascending, the capsules being patent by the curvature of the top of their stalks. The leaves of *C. triviale* are much longer, the pubescence is not glutinous, and the seeds are considerably larger." Mr. Babington thinks Curtis's *pumilum* may be identical with *glutinosa*, *Fries*, which = *obscurum*, *Chaub.*, and also that, should this view be correct, the oldest name, *pumilum*, is inappropriate, since French and Swedish plants are often large. Mr. Babington, in conclusion, wishes botanists during the approaching spring to examine attentively the smaller *Cerastia*, especially in the neighbourhood of Croydon, where Dickson found his plant. I beg to join in this wish, for I cannot help considering our knowledge of the *Cerastia* as extremely imperfect. I hope the results will be published in the 'Phytologist.'

Mr. Buckman states that having examined some plants of *Lamium album* with more showy inflorescence than usual, he found that this peculiarity was due to a deviation from normal form in the corolla. In the place of the "little reflexed teeth," described by Sir J. E. Smith as occupying the sides of the throat, were large lateral lobes. This aberration has been observed during three successive seasons.

Mr. Henfrey under the next head, "Literature," notices the publication of a third edition of Schleiden's 'Principles of Scientific Botany,' in which the chief additions relate to Suminski's work on the reproduction of ferns, to the conflicting views respecting impregnation, and to the general physiology of nutrition. The author expresses himself satisfied that no such phenomena as those described by Suminski are to be observed, and therefore that no such act of impregnation takes place: he also maintains his own views respecting the import of the pollen-tube, in phænogamous plants, in the fertilization of ovules. Also of a sixth fasciculus of Pritzel's 'Thesaurus

Literaturæ Botanicae; and Fresenius's 'Contributions to Mycology.' Then follow the contents, without comment, of the 'Annals of Natural History,' 'Hooker's Journal of Botany,' 'The Phytologist,' 'Schlechtendal's Linnæa,' 'Botanische Zeitung,' and 'The Flora.' Proceedings of Societies: Botanical Society of Edinburgh; Botanical Society of London. Records of Localities: *Hypericum calycinum* three miles from Haverfordwest, on the road to St. David's. I was not aware that any interest attached to the record of road-side stations for this plant. If the reader take the coach from Worcester to Aberystwith, he will very frequently see its large yellow flowers in the hedges. *Hypericum linariifolium* in the island of Guernsey; *Dudresnaia coccinea* shores of Arran; *Juncus diffusus* near Ross; *Bromus racemosus*, *Rosa cinnamomea*, and *Medicago sativa* near Clonmel. The number concludes with "Foreign Gleanings," consisting of Professor Schnizlein's discovery of flowers of the common beech containing both stamens and pistils, and also of remarkable monstrosities in the flowers of the weeping willow; Dr. Müller's method of mounting small objects for the microscope in the fissures of a partially split talc, which closes by its own elasticity; Professor Goppert's notice of a gigantic fossil-tree, thirty-two feet in circumference, and which has probably lived 2500 years; and Dr. Cohn's observations on organic life in the atmosphere. And finally, with notices of collections of plants for sale.

Although it is easy to conceive the great difficulty of keeping up a periodical like the 'Gazette,' yet I trust the editor will not shrink from the labour he has undertaken. I exceedingly regret that he contemplates "the exclusion of a portion of the articles derived from foreign works." I hope he will reconsider this determination, since it appears to me that foreign works are the source whence the 'Gazette' derives its interest.

*Notice of 'Hooker's Journal of Botany and Kew Garden Miscellany,'
No. 25, January, 1851.*

The dearth of botanical literature of which I have already spoken pervades this periodical equally with the last. The contents are as follow:—

'Report on the Brown Scale, or Coccus, so injurious to the Coffee-plants in Ceylon; in a letter from the late George Gardner, Esq.,

Director of the Botanic Garden at Peradenia, addressed to the Colonial Secretary at Colombo. Communicated by the Right Hon. Earl Grey, Chief Secretary for the Colonies.'

'Short Notice of the African Plant, Diamba, commonly called Congo Tobacco. By R. O. Clarke, Esq., Surgeon and Colonial Apothecary to the Colony of Sierra Leone. Communicated by the author.

'The Origin of the Existing Vegetable Creation. By Professor J. F. Schouw. From the Transactions of the Meeting of the Scandinavian Naturalists at Copenhagen, in 1847. Appendix K. 119. Translated from the Danish, by N. Wallich, M.D., F.R.S., V.P.L.S.'

'Decades of Fungi. By the Rev. M. J. Berkeley, M.A., F.L.S. Decade xxxi., consisting, with the exception of one species, of the novelties collected by Mr. Spruce in his visit to the Pyrenees and the province of Parà, in Brazil.'

'Physical Geography of Sikkim-Himalaya. Extract of a letter from Baron Humboldt to Sir W. J. Hooker, 'together with a copy of a letter on the Physical Character of Sikkim-Himalaya, addressed to Baron Humboldt, by Jos. D. Hooker, R.N., M.D., F.R.S., &c.'

Advertisements of 'Plants for Sale.'

However unbotanical, this number is far from uninteresting; in fact, the entomological communication from the late lamented Mr. Gardner and the physico-geographical paper by Dr. Hooker are far more readable than the more botanical contribution, 'Descriptions of Fungi,' of the Rev. Mr. Berkeley.

The entomological paper is one of great interest, not only in a scientific point of view, as exhibiting the empire attained in some instances by the animal over the vegetable world, but also in an economical point of view; it is, however, greatly to be regretted that the numerous remedies proposed have been found totally ineffectual.

Diamba, Congo tobacco, Bang, and Indian hemp are presumed to be local or mercantile appellations of the plant known to botanists under the name of *Cannabis sativa*, and its poisonous properties have long been known. Pareira, in his 'Materia Medica,' informs us that in Asia and Egypt it is used for the purpose of intoxication. In the interior of tropical Western Africa it is supposed to be indigenous, and "a story is told of its discovery by a huntsman, who observed a number of antelopes, who had browsed upon the Diamba, to be stupefied; and having informed his neighbours of the extraordinary circumstance, they repaired in a body to the spot. The approach of the people, or firing of their muskets, had, however, no effect in rousing

the animals to a sense of their danger, and accordingly they were all quickly despatched. It is smoked from a large wooden pipe or reed, called Condo, or from a small calabash, but common clay pipes are also used: it is extensively consumed by many of the liberated Africans and creoles, who frequently meet at each other's houses, to enjoy the luxury and soothing influence of Diamba. Upon these occasions the pipe is handed about from mouth to mouth, and soon produces the desired intoxicating effect. The smoke, twice or thrice drawn into the mouth, is there detained, and large portion is swallowed, as it slowly passes off by the nostrils: most agreeable sensations follow, and excitement displays itself in hearty bursts of laughter, loud exclamations, droll and exhilarating conversation; but as the debauch proceeds, its full effects are developed. Temporary frenzy seizes the smokers, and they issue from their haunts, singing and shouting, as they reel and stagger to their homes. Intense and maddening head-ache, accompanied with stupor, is often the result of these orgies, and the latter consequence generally lasts for twelve hours. One pipe charged with this powerful drug, is enough to produce in four persons the most delightful exaltation without injury, and it is much esteemed by the natives as a remedy for cough, pains in the chest and stomach."

The other papers neither require comment nor admit of extract.

Notice of the 'Annals and Magazine of Natural History,' Second Series, No. 38, January, 1851.

The botanical papers in this number are two, intituled as follows:—

‘Notes on the Diatomaceæ; with descriptions of British species included in the genera *Campylodiscus*, *Surirella* and *Cymatopleura*. By the Rev. William Smith, F.L.S.’

‘A few Remarks on the Menispermaceæ. By John Miers, Esq., F.R.S., F.L.S.’

Mr. Smith commences his communication by remarking how much we are in want of a work on the British Diatomaceæ, and everyone must join in his wish that Mr. Ralfs may have so far recruited his feeble health by his late sojourn on the continent as to be enabled, at no distant day, to undertake a work for which he is so eminently qualified. With regard to both communications, I may briefly state

that they are of that purely technical character which, however valuable as works of reference, cannot be transferred, even in abstract, to the pages of a popular journal.

*Notice of the 'Transactions of the Tyneside Naturalists' Field-Club,'
Vol. I., Part 5.*

The 'Phytologist' was the first periodical that invited the attention of naturalists to the published 'Transactions' of this energetic and praiseworthy band of naturalists, and at the same time I ventured to hold up the example to observers in other parts of the kingdom, and to express my humble opinion that it was worthy of all imitation. I have to regret that the 'Parts' of these 'Transactions' have not been regularly transmitted, inasmuch as I have thus been deprived of the pleasure I should experience in noticing them with regularity and approbation. The present part contains a hundred and twenty-four pages of letter-press and three admirable plates, but is chiefly devoted to zoological papers. The gleanings in botany which appear below are contained in the President's Address.

"The first field meeting took place on the 18th of May, on the banks of the Wansbeck above Morpeth. The weather at the time of starting, and indeed during the day, being somewhat unfavorable, but few of the members attended. They assembled at Morpeth station and strolled by the side of the Wansbeck as far as Mitford, and after a pleasant ramble of several hours, in which a few plants were collected, including *Arabis hirsuta*, *Myrrhis odorata*, *Arabis thaliana*, and several ferns, they returned towards Morpeth. Two of the members, Mr. Storey and Mr. Burnet, intending to search for *Equisetum umbrosum*, had proceeded by an early train several miles to the northward of Morpeth. The *Equisetum* referred to appears to have been first noticed in Northumberland (only the second recorded English locality), by Mr. Joseph Sidebotham, who announced this interesting discovery in the 'Phytologist' for 1848. After walking three or four miles, they had the good fortune to collect several specimens of this rare plant on the banks of the Coquet near Felton; but as the season was somewhat advanced, only two fertile stems were procured. By the side of the same stream *Equisetum hyemale* and *E. palustre* were likewise observed.

"The second meeting was at Dipton and Devil's Water, on the

8th of June. On this occasion there was a better attendance of members. Starting from the Hexham station, the party proceeded to Dipton, or Deepdene, as I believe it was originally called: from thence two or three of the members extended their walk by Dotland Park to Dukesfield, in search of *Lysimachia vulgaris*, which had lately been observed to grow in that place. They fortunately succeeded in obtaining the object of their search. The rest of the party spent the morning very agreeably in following the downward course of Dipton Burn, through a romantic valley, varied with bold rocks and overhanging woods. Some rare plants were collected, particularly *Neottia Nidus-avis* and *Melica nutans*.

"The third meeting took place on the 22nd of June. The tract of country selected for the excursion was Hordondene. The usual magnesian limestone plants were gathered, including some of the rarer of the *Orchis* tribe; *Epipactis ensifolia* was got in fine flower; and the fly orchis (*Ophrys muscifera*) was also obtained. The beautiful *Primula farinosa* was found growing in such profusion in one spot near Easington, as to colour the ground with its lilac flowers.

"The fourth meeting was at the Northumberland lakes, on the 20th of July. The party pursued the devious footing of a rustic track through the valley of Bardon Burn to Chesterholme. The wooded sides of the valley afforded one or two good plants to the botanist, the most attractive of which was the pretty *Pyrola minor*. *Crepis succisæfolia* and *Orobanche major* were likewise gathered. At Chesterholme the numerous well-preserved antiquities obtained from the neighbouring station attracted much attention. After exploring the remains of the Roman station of Vindolana, the party crossed the country to the old military road, in the vicinity of which are the little moorland lakes, or loughs, as they are provincially called, that were to form the boundary of the day's excursion. These loughs, situated in a wild district unadorned with wood, possess little picturesque beauty, with the exception of Crag Lough, a small sheet of water lying beneath fine basaltic cliffs, formed by the *whin-sill*, which here rises into a range of hills crossing the country in a direction nearly east and west, and presenting a bold escarpment to the north. These hills give a striking character to the surrounding scene, and are well known to the antiquary from the circumstance of the celebrated Roman wall passing along their summits. A few of the members explored the northern shore of Crag Lough, where Mr. Storey gathered *Potamogeton rufescens*, *P. perfoliatus* and *P. pecti-*

natus: the remainder pursued the line of the Roman wall over the crags, descending to the lake at the east end, where some of the more assiduous naturalists commenced turning over the loose stones at the water's edge. This search was rewarded by the discovery of two beautiful freshwater zoophytes, new to the north of England, which were obtained by Mr. Albany Hancock. A few freshwater shells were observed, among which were *Physa fontinalis*, *Planorbis albus*, and *Ancylus lacustris*; these were all of small size, apparently dwarfed by their exposure in this elevated situation. A scarce little bivalve, *Pisidium nitidum*, was also found. Bromley Lough was only reached by two of the botanists, Mr. Storey and Mr. D. Oliver, intent upon gaining 'the glory of this barren waste,' the beautiful white water-lily (*Nymphæa alba*), which here grows truly wild. *Scutellaria galericulata* was likewise found, growing upon the margin of this lake.

"On the occasion of the fifth meeting, the members assembled at Hallwhistle Station; whence the walk led to Wall Town Crags, a favorite locality of the botanist on account of the rare plants that here grow on the basaltic rocks. The plants of this locality, which had been visited by the Club on a former occasion, are so well known that it is unnecessary here to enumerate them. The remainder of the day was spent in traversing the wild and undulating country towards Gilsand. During this walk and on the banks of the Irthing the following plants were obtained. *Saxifraga aizoides*, *Galium boreale*, *Hieracium boreale*, *H. umbellatum*, *Vicia sylvatica*, *Potamogeton gramineus*, *P. pusillus*, and *Asplenium viride*.

"An evening meeting for the reading of papers was held in the Rooms of the Natural History Society in Newcastle, on the 12th of December. Numerous beautifully dried and mounted specimens of flowering plants, collected at the field meetings by Mr. D. Oliver, jun., were displayed on the tables; as were also a series of forty exquisite prints in chromo-lithography, being the proof-plates of a work about to be published on the Cephalopoda, or Cuttle Fishes, of the Mediterranean, by M. Verany, of Genoa: accompanying these, specimens of the animals in spirits were exhibited, particularly that of the *Argonauta Argo*, or paper nautilus, about which there has been so much controversy among naturalists. Many illustrated works on Natural History, belonging to the Literary and Philosophical Society, were also laid on the tables. The company having adjourned to the Committee-room, two short papers,—'Additions to the Mollusca of Northumberland and Durham,' and an 'Account of

three new species of Animalcules,'—were read by the President, the former illustrated by specimens. The next paper was by Mr. Carr, of Dunstan Hill, 'On the composite names of places, of Anglo-Saxon derivation, chiefly in Northumberland.' Mr. Tate, of Alnwick, followed with a paper 'On polished and scratched Rocks, viewed in connexion with the Northumbrian boulder Formation,' which was listened to with great attention. 'Notes on a species of Hydra found in the Northumberland lakes,' and extracts of an elaborate paper (which time would not allow of being read entire) 'On the Anatomy of the Freshwater Bryozoa, with descriptions of three new species,' by Mr. Albany Hancock, were read by the Secretary. Mr. Wailes in conclusion, called the attention of the meeting to the splendid coloured plates of Bateman's 'Orchidaceæ of Mexico and Guatamala,' a copy of which he had kindly sent for inspection, together with another beautiful work, Hooker's 'Rhododendrons of the Sikkim-Himalaya.' "

Microscopical Society of London.

November 13, 1850. Dr. Arthur Farre, President, in the chair.

Dr. Carpenter made some remarks on Foraminifera, in reference to the paper by Mr. Williamson on that subject, read at the meeting in June last.

Mr. De la Rue described the construction of a dissecting microscope, made by M. Nachet.

A paper by J. S. Bowerbank, Esq., 'On Ciliary Action in the Spongiadæ,' was read.

After some preliminary remarks, in which some observations of Dr. Dobie on the same subject were alluded to, Mr. Bowerbank stated that, wishing to follow out the investigation, he had, in the autumn of the present year, located himself in Tenby, in South Wales, where the sponge (*Grantia compressa*) examined by Dr. Dobie is found abundantly. The specimens selected for examination were not more than a quarter of an inch in length, and upon placing one of these beneath the microscope, in a closed cell, after a short time the excurrent action commenced, and continued steadily for a considerable time, the fecal matter being ejected with much force. On examining the exterior of the same specimen, the incurrent action over the whole of its surface was equally well, although less forcibly, demonstrated.

Having thus succeeded in seeing the continuous entrance and exit of the surrounding fluid, the great saccular cavity was next examined. This was done by carefully opening the sponge, from the entrance of the sac to its base, with a pair of fine scissors, cutting through its compressed edges. The halves thus produced were mounted for examination in a closed cell as before, with the inner surface towards the eye. The sponge was now seen to be composed of angular cells, constructed of triradiate, calcareous spiculæ, and packed together like the cells of a honeycomb. They are of the same diameter downwards for the length of about half their own diameter, and then terminate in a perforated diaphragm, the circular mouth of which is of about half the diameter of the cell above it. Beneath this diaphragm an elongated cavity or cell extends, and opens on the outer surface of the sponge; the whole length of the cell, from the inner edge of the diaphragm to its termination near the outer surface, being closely studded with tessellated, nucleated, cellular structure. Within the diaphragm, and between the inner termination of the incurrent orifices, are situated the cilia, which are of excessive tenuity, and comparatively of considerable length. Upon focussing the diaphragm, the cilia may be seen in rapid motion within the area of the circular orifice, many of them being tipped with a minute portion of a gelatinous or of fecal matter, and the whole of them continually oscillate in a plane parallel to the edge of the diaphragm, occasioning a continual current through its orifice.

Although both the presence and action of the cilia were very clearly shown by this mode of examination, still neither the extent of surface covered by them, nor their insertion, could be determined. By dividing, however, one of these cells through its whole length, which, after many trials and failures, was at last effected, portions of these, examined in the same manner as in the preceding instances, exhibited ciliary action; and as the vital energy decreased and their motions became languid, one cilium in particular was observed, which continued for nearly half an hour to wave gently backward towards the outer surface of the sponge, and then rapidly forward towards the mouth of the diaphragm. Many other cilia were observed, but none so distinctly exhibited their peculiar action as this; and it was found that although it may be highly probable that the cilia are based upon, or spring from among, the tessellated cells, it was not possible to ascertain the fact precisely; but sufficient was shown not only to prove the existence of ciliary action in the sponge, but also, by the peculiar motion just described, to account for the flow of the current in one direction.

December 11, 1850. Dr. Arthur Farre, President, in the chair.

A paper by P. H. Gosse, Esq., 'On the *Notomata parasita*, *Ehrenb.*, a rotiferous animal, inhabiting the Spheres of *Volvox globator*,' was read.

After stating that this animalcule was first described by Professor Ehrenberg, in 1835, Mr. Gosse stated that he first observed it on the 26th of June, 1850, in specimens of *Volvox globator*, in water, given him by Alfred Rosling, Esq. He afterwards obtained it from a little pool near the railway-station at Leamington, in Warwickshire. This creature is too small to be seen by the unassisted eye, its greatest length being about a hundred and sixtieth of an inch. The author minutely described the anatomy of this animalcule, and also gave an account of its curious habits, it being parasitic in the elegant *Volvox globator*, within the globe of which it lives at ease, swimming about like a gold-fish in a glass vase. It appears to subsist upon either the green granules with which the gelatinous surface of the *Volvox* is studded, or else upon the embryo clusters. It often happens that two or more *Notomatae* are seen in the same *Volvox*, and Mr. Gosse states that in one individual he had met with as many as four, with an egg besides. They are to be found chiefly in the smaller *Volvoes*, and especially in those which have the embryos in a very immature state. They have also been met with in the embryos themselves when almost grown and nearly ready for escape from the parent globe. The operations of this parasite do not appear to occasion any perceptible inconvenience to the containing *Volvox*. In some spheres eggs are found with *Notomata*, in others eggs alone. Mr. Gosse also stated his opinion that it was possible that this parasite is always hatched in a parent *Volvox*, but that the embryonic globe is entered from without. He next described the eggs, some of which are smooth, and others covered with prickles; and he suggested that, as in these animals the sexes are distinct, both as regards size, form and structure, the smooth eggs might be those of females, and the prickly ones those of males. He concluded with some remarks on the habits of this curious parasite.

Another paper by G. C. Handford, Esq., 'On a white Mirror for the Microscope,' was also read.

Wishing to correct the unpleasant glare and other inconveniences attendant on the reflected light of an ordinary silvered glass mirror, the author was induced to construct one by which he considers these defects may be remedied. It consists of a thin, concave glass, three inches in diameter, the back of which is rendered white by means of

plaster of Paris or of zinc paint. This is mounted on brass and fitted over the frame of the ordinary silvered mirror, thus not requiring the latter to be removed. The advantage gained by this mirror he stated to be, that the whole of the rays reflected from the surface of the plaster of Paris were brought into one focus, together with those reflected from the surface of the glass, and thus a more equal and also a more brilliant light is produced than by any of the means heretofore employed for the purpose of getting a perfectly white light. —*J. W.*

Botanical Society of Edinburgh.

Thursday, November 14, 1850. Professor Fleming, President, in the chair.

The Curator gave in a report on the state of the herbarium, noticing that considerable progress had recently been made in the arrangement of the collections, and that four additional cases had been obtained. Several important additions of foreign plants were likewise noticed.

The following papers were read :—

1. ‘On the British species of *Carex* ;’ by John M’Laren. The author stated that the substance of this paper was contained in an essay written last summer for Dr. Balfour’s class. He had since re-examined all the species, with the view of improving the descriptions, and was happy to acknowledge his obligations to Dr. Arnott’s edition of the ‘British Flora,’ recently published, for some important particulars which he had not previously observed. Among the more important works which he had consulted were also Goodenough’s ‘Monograph of the British Carices,’ in the ‘Linnean Transactions,’ Schkuhr’s ‘Monograph’ (the French edition), Kunth’s ‘Enumeratio Plantarum,’ Fries’ ‘Summa Flora Scandinaviæ,’ Babington’s ‘Manual,’ and the figures in the ‘English Botany’ and its Supplement. Some others are quoted along with the synonyms. The author stated that, in the present state of the science, unanimity could hardly be expected among naturalists with regard to the true limits of species ; but as it was necessary, in describing the Carices, to adopt an opinion on this subject, he thought it better to lean to the side of simplicity, and rather to unite two plants whose identity might be doubtful, than to retain them as ambiguous and ill-defined species. The result of these

alterations is, that about ten of the species described in recent botanical works have been inserted merely as varieties.

While agreeing with Reichenbach in dividing this large and natural genus, the subgenera have not been made to depend on the number of stigmas, because by that arrangement *C. cæspitosa*, *C. saxatilis*, &c., are placed along with the species which have compound androgynous spikes, and *C. pauciflora* and *rupestris* are likewise separated from the species with simple solitary spikes. In the general classification, the system of Fries has therefore been followed; but in the arrangement of the species some alterations have been made. The usual mode of arranging the British species with glabrous fruit and terminal barren spikes appeared to the author exceedingly vague, and liable to many exceptions on account of the difference in the number, form, and direction of the spikes, even in the same species. He has therefore re-arranged them according to the nature of the bracts and fruit, as will be seen from the subjoined table:—

Subgenus *Vignea* (of Reich. in part): spikes simple, solitary or compound, androgynous.

A. Spikes simple, solitary; *Monostachyæ*, *Fr.*

B. Spikes compound, androgynous; *Homostachyæ*, *Fr.*

I. Bracts not foliaceous, spikelets fertile below; *Hyparrhenæ*.

1. Root creeping.

2. Root fibrous.

II. Bracts long and foliaceous; *Bracteosæ*.

III. Bracts not foliaceous, spikelets fertile above; *Acroarrhenæ*.

Subgenus *Carex* (*Heterostachyæ*, *Fr.*): spikes simple, distinct, the terminal ones barren or androgynous, the rest fertile.

I. Spikes unisexual, achenes biconvex, stigmas two; *Distigmaticæ*.

II. Terminal spike androgynous, fertile above, stigmas three; *Tristigmaticæ Mesoarrhenæ*.

III. Spikes unisexual, achenes trigonous, stigmas three; *Tristigmaticæ Acroarrhenæ*.

1. Fruit smooth, bifid; bracts without sheaths.

2. Fruit smooth, entire; bracts sheathing.

3. Fruit smooth, bifid; bracts sheathing.

4. Fruit pilose, deeply bifid.

5. Fruit pilose, entire or nearly so; bracts foliaceous.

6. Fruit pilose, entire; bracts membranous, sheathing.

Mr. M'Laren then proceeded to give descriptions of the various British species and varieties, and illustrated the paper by specimens and dissections.

2. 'Notes of a Botanical Trip to England;' by John T. Syme. Mr. Syme went to London on the 27th of August, and made Hampstead his head-quarters during the first fortnight of his excursion. Here he noticed the frequency of *Solanum nigrum*, *Scutellaria minor*, *Lemna polyrhiza*, *Mentha Pulegium*, and the occurrence of *Chenopodium glaucum*, *polyspermum* and *ficifolium*, *Rumex palustris* and *pratensis*, and *Erysimum cheiranthoides*. At Battersea Fields he observed *Scirpus triqueter* and *carinatus*, *Datura Stramonium*, *Chenopodium ficifolium* and *hybridum*, *Erigeron canadensis*, *Rumex palustris*, and *Œnanthe Phellandrium*. Mr. Syme also visited Putney Heath, where he gathered *Acorus Calamus*, *Actinocarpus Damasodium*, *Rumex maritimus*, and *Marrubium vulgare*. *Scirpus carinatus* was very fine near Wandsworth Pier, and *Setaria viridis* grew in a field near Lavender Hill; *Villarsia nymphæoides* occurred in the ponds on Wandsworth and Clapham Commons. Mr. Syme then went to the Isle of Wight, where he found *Mentha rotundifolia*, *Juncus obtusiflorus*, *Cyperus longus*, and other plants of less interest. He also visited Norfolk. At Norwich, *Datura Stramonium* and *Verbascum pulverulentum* were found; and *Rumex palustris*, *Corynephorus canescens*, *Chenopodium murale*, and *Cicuta virosa* near Yarmouth. At Belton, in Suffolk, he noticed the occurrence of *Potamogeton pectinatus*, *Sium latifolium*, *Althæa officinalis*, and *Hordeum maritimum*; and at Lowestoft, *Urtica pilulifera* was found, by Mr. Babington's directions to its locality, and *Rumex pulcher*. Mr. Syme returned to Edinburgh on the 17th of September, and was able to send between 500 and 600 specimens of plants to the Society, belonging to species with which it was previously very ill supplied.

3. 'Notice of the Discovery of *Saxifraga Hirculus* in Boovland Moss, Walston, Lanarkshire, in September last;' by Geo. J. Blackie. The following are the Scottish stations in which this plant has been found:—

Langton, Berwickshire.

Source of the Medwyn, Pentland Hills, about eighteen miles southwest from Edinburgh, where it was first gathered by Dr. Alexander Hunter, September 11, 1836.

Wet moor on the farm of Jacksbarns, or Jackston, parish of Glenbervie, Kincardineshire, where it was found by Mr. James Rae, June 29, 1839.

On a wet moor between Fala and Stowe.

On the northern side of the Ochills, not far from Dollar, found by Mr. Wyville Thomson.

Near Walston, Lanarkshire, found by Mr. Blackie.

Dr. Balfour noticed the discovery, by Mrs. Balfour, in August last, of *Ginannia furcellata*, of Turner, in Lamlash Bay, Arran. This is the first Scottish station for the plant. The Rev. Dr. Landsborough has subsequently received this species from the same station, dredged by Major Martin, Ardrossan. Specimens of the plant in fructification were shown, both in the dry state and preserved in creosote, and some were exhibited under the microscope.

Dr. Balfour exhibited a recently invented apparatus for drying plants, which had been sent to him by Mr. John Ball, of Dublin. The principle on which the apparatus was constructed is to allow free circulation of air, so that both plants and paper are dried without much changing.

There was exhibited, from Mr. Charles Lawson, a large plant of Tussac Grass, grown in Orkney. Some recently received tufts of this grass, when fresh, weighed about 1 cwt.

Dr. Balfour exhibited specimens illustrating the production of Vinegar.

No. 1. The so-called vinegar-plant, with vinegar produced by it.

No. 2. Syrup into which the plant had not been introduced, but which had been left for four months undisturbed. In it a peculiar fungus-like growth similar to the vinegar-plant was found, and the fluid had become vinegar.

No. 3. A specimen of vinegar produced by the vinegar-plant, which had been filtered and then allowed to stand for several months, and in which a fungus similar to that called the vinegar-plant had been formed.

Dr. Balfour thought the so-called vinegar-plant must be considered the Mycelium of some fungus produced in a peculiar fluid, and which acted as a ferment. The addition of any ferment would probably cause a similar production of vinegar.

A peculiar forked variety of *Lastrea Filix-mas* was exhibited by Mr. Thomas Anderson, which he had picked in the neighbourhood of Clonmel.

A Word with Sir William J. Hooker and George A. Walker-Arnott.
LL.D., &c. By LASTREA RECURVA.

MOST potent, grave and reverend signiors! I hold that you have wronged me. You not only rob me of a name, but of my standing in society, treating me as one of that ephemeral race universally known amongst us foresters by the soubriquet of phantasmata,* and generally supposed to be mere creations of the human brain. My elegant sister, Filix-fœmina, the only near relation I have in this country, calls them ghosts, because, like ghosts, they never appear to more than one person, and are invisible to everybody else. Now this is a great mistake of yours, as you would yourselves find if you would condescend to visit me, either here or in Cornwall. But between ourselves, reverend signiors! you really cannot judge of the matter fairly when you merely peep through your glasses at my cast-off clothes. Come into the woods of Killarney, where you will find me perfuming the air with my sweet, sweet breath, and where I chatter all day long with my pretty cousin, *Trichomanes speciosum*, whom you have nicknamed *Trichomanes radicans*, a point on which you ought to have consulted my friends Robert Brown and Mr. Bennett, both of whom would have told you better. But may be you don't care so much about being right as you do about spreading your own doctrines. Ah! if you were but as wise as you are learned, you'd just teach the truth, and trust to old time to take care of your teachings.

Now let me ask you one question. Is it right of you so to state a fact as to give a wrong impression? You say at page 570, "One state (meaning me) of the plant (meaning family), however, we are desirous of noticing (and many thanks to you for your notice, which sure I scarce deserve), from the great discussion it has occasioned in some of the periodicals (meaning the 'Phytologist,' which you wouldn't, I know, mention if you could avoid it, and which, by the way, is *one*, not *some*), namely, *Aspidium dilatatum*, var. *recurvum*, of Bree in Mag. of Nat. Hist. vol. iv. p. 163, cum ic. (all which you learn from Newman's 'British Ferns,' as now follows). *Lastrea recurva* of Mr. Newman in 'British Ferns,' 1844, p. 226. We find no specific character in the latter work; but this deficiency is compensated by Mr. Babington, who thus distinguishes it" (meaning

* "Phantasma quod Cicero visum vocavit."—*Pliny*.

me). Now this is the *truth*, but then it is not *all the truth*, and therefore gives a wrong impression, for you know as well as I do that Mr. Newman *first* gave me a specific character, in the 'Naturalist's Almanack,' and that Mr. Babington followed Mr. Newman, adopting his character almost word for word. All Mr. Newman's "specific descriptions" are in the 'Naturalist's Almanack' for 1844, and you will find the original specific description of myself is properly referred to in the 'British Ferns,' in the very page you have so attentively studied.

You go on to say, "We cannot say much in favour of the figure of *Lastrea recurva* of Mr. Newman (at hearing which no doubt Mr. Newman will tear his hair, as the ancients were wont to do when suffering under the displeasure of the gods), which has a very lax habit, with distant pinnules, and moreover, being stated to be 'one-fourth the natural size,' and, though folded, yet occupying the entire 8vo page, must be a large plant,—nearly four feet high, including the stipes." I will not assume that you have ever heard of Euclid, Cocker or Walkingame, all of them vulgar writers for school-boys, men who were ignorant of botany, but who happen to have enjoyed a wholesome reputation in their peculiar departments of mensuration and calculation. I will conclude you know nothing of them,—nothing at all; but I assure you they are respectable authorities in their way, and, guided by their teachings, I will give you my deductions. I first measure Mr. Newman's likeness of me without the stipes, and find it covers less than eight superficial inches; I then take up Euclid, and find that, to obtain a superficies four times as great, I have to multiply the number of superficial inches by four; I then consult the recondite although vulgar Cocker, and find that four times eight are thirty-two; and finally, I check this calculation by Walkingame. This may be fairly estimated as a length of eight inches, and an average breadth of four inches. My stipes is represented as long as, or perhaps a little longer than, my leaf, say eight inches and a half, and thus we have a total length of sixteen inches and a half, which you,—not designedly, of course not; not to raise a laugh against Mr. Newman and myself, of course not; but from a want of acquaintance with the authors I have mentioned, and a consequent ignorance of the mode of calculating superficial admeasurements,—have converted into four feet. I will support Mr. Newman, by saying that his estimate of my average magnitude is a correct one.

You then proceed to compare me with *Nephrodium Fœnisecii* of Mr. Lowe; with what success I will not pretend to say, but as I grow

in profusion in Madeira, and from that country have reached the hands of Mr. Ward, Dr. Lemann, Mr. Watson, and many others, I think there is no reason to doubt that he included me in the species which he so named; but then, as you observe, you “have both Mr. Lowe’s varieties, α . and β ., from Madeira, so marked by (your) valued friend Dr. Lemann; and there cannot be better authority for Mr. Lowe’s plant (in which I fully concur; and) these unfortunately tell a different tale;” and subsequently one of you, *viz.*, George A. Walker-Arnott, LL.D., &c., makes this assertion in the ‘Annals of Natural History:’—“I possess *Nephrodium Fœnisecii*, *Lowe*, from Lowe himself, and it is clearly not the form or species called *Lastrea recurva* by Newman;” (Ann. Nat. Hist. vi. 473). From all this I infer that Lowe’s *Fœnisecii* is what has been called a “collective” species, that is, two or three of us rolled into one, a practice that saves a deal of trouble and a deal of time, yet is what may be called a slow or *andante* movement compared with the more brisk and exciting labour of creating species out of one’s own imagination.

But abandoning the question of identity between *Fœnisecii* and myself, allow me to ask, in the most humble manner, by what means you so positively identify me with your *spinulosum*, γ . You admit you can make nothing of Mr. Newman’s figure of me, and you say you find in Mr. Newman’s book no specific description, and yet you positively identify me as your *spinulosum*, γ . This is “passing strange!” You know me by my unintelligible effigy, by a representation that I am four feet high, and by the entire absence of a description. There is no doubt, no query, no hesitation. This indeed is superhuman wisdom! I have misgivings whether you are altogether canny! However, I rejoice to be thus raised to the honorable position till lately occupied by my lovely mountain friend, *rigida*. You surely have not forgotten that the lady now known as *Lastrea rigida* was the *spinulosum*, γ ., of the earlier editions of the ‘British Flora,’ not, however, of the fifth edition: there something else figures as *spinulosum*, γ .; something found at “Bingley Wood, near Halifax, by Mr. W. Wilson;” something that had the “pinnules and segments very unequal in size and in their spinulose serratures;” something, in fact, which you suggest may be “a monstrosity.” Thus your *spinulosum*, γ ., is of rather protean character: one year it is *Lastrea rigida*! another a monstrosity!! another *Lastrea recurva*!!! What will it be next? You “can’t say!” I thought as much. I will answer for you. It will be nothing at all! By that time, reverend signiors! you must yield to the information and expression

of opinion now pressing you on all sides. You *must* adopt me. You may find an escape from Mr. Newman's name in calling me Fœnisecii, *Lowe* or *Lowi*, *Bab.* or Walker-Arnott, *Hook.* or Hookeri, *Walker-Arnott.* I care nothing for little indignities of that kind; but to adopt me under *some* name is inevitable. You must give each of us our true *status* in society, whether you will or no. The working, thinking, reading, cultivating botanists of the present day expect this at your hands, and you will be too wise to withhold it. The sixth edition of the 'British Flora' is a long step in advance of the fifth, and the fifth a long step before the fourth. Further concession must be made, and let me entreat you to make it gracefully and courteously. Show your respect for all that is done well, *and never mind by whom.* None of us think you have treated Mr. Newman with the courtesy or kindness which his book deserves. You seem angry with him because he has done so much for us; and we can't understand it: we all exclaim with Nature's poet,—

"Tantæne animis cœlestibus iræ?"

In doing good to us what harm has he done you? He never mentions either of you unless with that respect to which all agree your talents and labours entitle you. In fact, in the 'British Ferns' he often goes out of his own way to bring in the name of Sir William Hooker, seemingly for the express purpose of testifying his respect for so illustrious a botanist.

Believe me, Reverend Signiors! your devoted but aggrieved servant,

LASTREA RECURVA.

Killarney, December 25, 1850.

South-Devon Locality for Adiantum Capillus-Veneris.

By T. B. FLOWER, Esq., F.L.S., &c.

I HAVE sent you specimens of *A. Capillus-Veneris* from rocks in Mewstone Bay, Berry Head, South Devon, as I am not aware of its being recorded growing in the south of Devon before, it being interesting in a geographical point of view. The specimens from Ilfracombe are merely sent to show that the station is not destroyed.

T. B. FLOWER.

Seend, Melksham, Wilts.

On the Locality for Typha minor in Kent.

By T. B. FLOWER, Esq., F.L.S., &c.

I OBSERVED, a few days since, while looking over the recent edition of the 'British Flora,' by Sir. W. Hooker and Dr. Arnott, a locality recorded for that rare plant *Typha minor*, on the authority of Dr. Bromfield, in the following words:—"I have a distinct recollection of having seen specimens of this plant, some years ago, at the Linnean Society, which the late Mr. David Don gathered somewhere, I think, in Kent." Now I perfectly recollect this circumstance. In October, 1839, my late lamented friend, Professor Don, showed me, at the Linnean Society, specimens of what he considered to be *Typha minor*, which had been collected in Kent, and being interested with the discovery I made a note of it. Some time after, wishing to obtain the exact locality, I called on the Professor, when he informed me that he had changed his opinion, and that the plant could not be considered anything more than a small form of *Typha angustifolia*. I have therefore availed myself of the present opportunity of recording the error in the pages of the 'Phytologist,' in the absence of Dr. Bromfield, who, I believe, at the present time is not in this country, and to whom the above statement may possibly be acceptable, and not only to that gentleman, but to botanists generally.

T. B. FLOWER.

Seend, Melksham, Wilts,
February 6, 1851.

A few Notes on the Stations, &c., of Plants.

By H. L. DE LA CHAUMETTE, Esq.

Anemone ranunculoides. This very pretty *Anemone* is very common all along the banks of the Maladière, on either side of the old bridge, Canton de Vaud, Switzerland.

Trollius europæus. I found a field covered with the yellow flowers of this plant half way up the Mount Tour de Gourze, Canton de Vaud, Switzerland, in the year 1843.

Helleborus foetidus. Common in all the hedges and banks around Lausanne, Switzerland.

Hesperis inodora. I gathered a solitary specimen on the 19th of

April, 1850, in a field adjoining a country-house at Norwood, apparently growing quite wild.

Isatis tinctoria. Still growing abundantly in the chalk-pit at Guildford on the 25th of July, 1850.

Saponaria Ocymoides. I have gathered it in abundance along the shore of the Lake of Geneva, near a place called Les Pierrettes, growing on the sands.

Tilia parvifolia. A splendid specimen of this tree stands in Moor Park, near Watford: its circumference is about twenty-four feet.

Tilia europæa. A splendid specimen of this tree still stands near a small inn at Prilly, Canton de Vaud, Switzerland, measuring in circumference upwards of twenty-two feet, and the branches of it overshadow in summer three roads. A small fountain lies at its base.

Orobis vernus. I found this plant growing abundantly in the Forest of Sauvabelin, Lausanne, Switzerland, near the Cascade.

Geum intermedium. I found this plant in the same forest, growing among the thickets.

Potentilla micrantha and *verna*. Both these occur in the Forest of Sauvabelin; the former is reckoned rather scarce, although it grows freely in some parts of the forest; the latter is common all over the rocks.

Rosa alpina. Common on the Mount Tour de Gourze and in the Forest of Sauvabelin.

Bellidiastrum Michellii. Grows on the dry banks of the Wood of La Bâtie, near Geneva.

Cynanchum vinceioxicum. This plant grows at the back of Grandvaux and near Belmont and Rovereås, Canton de Vaud, Switzerland.

Heliotropium europæum. Common all along the Lake on the sands, from Coppet to Lausanne, Switzerland.

Pulmonaria officinalis. Found it abundantly in the Wood of Sauvabelin, near Lausanne.

Datura Stramonium. Environs of Lausanne, growing among rubbish and in uncultivated grounds here and there.

Daphne mezereum. Common in the woods around Lausanne.

Hippophaë Rhamnoides. Along the banks of the Lake of Geneva, growing in the sands. I brought up from a larva, which was found and fed on this shrub, a specimen of *Sphinx Hippophaës*.

Cypripedium calceolus. I gathered one solitary specimen at the summit of the Mount Tour de Gourze, Switzerland, in the year 1843.

Galanthus nivalis. Common in the fields to the north of Lausanne, Switzerland.

Maianthemum bifolium. I found this plant growing in the middle of the Forest of Sauvabelin, Switzerland.

Muscari racemosum, *comosum* and *botryoides* are all to be found in fields and vineyards in the neighbourhood of Lausanne, Switzerland.

Perhaps the following list of some of the names given by the country people to certain plants in Switzerland may not be unacceptable to the readers of the 'Phytologist.'

Oxalis acetosella, Pain de coucou, Alleluia.

Euonymus europæus, Bonnet de Prêtre, Bois carré.

Rhamnus frangula, Pouverne, Bourdaine.

Rhamnus catharticus, Quemot.

Genista tinctoria, La Marjolaine.

Ononis spinosa, Tendon.

Onobrychis sativa, L'Esparcette.

Prunus spinosa, L'Epine noire.

Cratægus oxyacantha, L'Epine blanche.

Cerasus mahaleb, Bois de Sainte Lucie.

Cornus sanguinea, Bois punais.

Valerianella olitoria, Trochette, Rampon.

Ligustrum vulgare, Sauvillot, Crucillion.

Lithospermum officinale, Herbe aux perles.

Lysimachia nummularia, Herbes aux ecus.

Paris quadrifolia, Raisin de renard.

Ornithogalum umbellatum, Dame d'onze heure.

H. L. DE LA CHAUMETTE.

Stoke Newington, February 1, 1851.

Note on Lastrea uliginosa. By MR. CHARLES WOOD.

As you solicit information respecting *Lastrea uliginosa* of Lloyd, I have to state that when Mr. Lloyd returned from a botanical tour in Nottinghamshire, in 1846, he supplied me with several ferns, all of which I potted in peat, &c., and they grew admirably. Amongst them I fancied I could detect a new form; at first I considered it

only a variety of *spinosa* or *cristata*, but of which I was at a loss to decide. I showed it to several botanical friends of mine, and they appeared as much perplexed as myself, some considering it a variety of one thing, and others differing from them. I named it to Mr. Lloyd, and inquired of him further particulars respecting its locality, &c., and he assured me that he had previously noticed the different characters of this fern, but supposed it merely a variety of *L. cristata*. Mr. Lloyd sent specimens to several botanists, requesting their opinions upon it, but no two of them arrived at the same conclusion; consequently it appears to form a connecting link amongst nearly the whole of the species of the genus *Lastrea*; but after cultivating it for four seasons without its characters in the least altering, I most decidedly agree with Mr. Lloyd and others in considering it as much deserving to rank as a species as either *Lastrea spinosa*, *cristata*, or *multiflora*. It would be superfluous on my part to attempt an explanation of its distinctive characters after the lucid manner in which Mr. Newman has pointed them out in the 'Phytologist' for October, 1849.

CHARLES WOOD.

Wandsworth Common,
February 10, 1851.

A Word more on Lastrea uliginosa. By EDWARD NEWMAN.

I CAN imagine the reader begins to feel nauseated with this subject, but I cannot resist the temptation to invite his attention to a passage in a former number (*Phytol.* iii. 101), where he will find that the distinguished Professor Braun, of Freiburg, whose name ranks high among European pteridologists, had previously described the same fern, found in the bog at Freiburg, in company with *cristatum*, under the same name. I beg to refer the reader to the page above mentioned; he will there find a translation of Braun's description, which, accompanied by the habitat, leaves little doubt as to the identity of the two plants. I feel that I have to apologise to the readers of the 'Phytologist' for introducing a second description when the first would have sufficed.

EDWARD NEWMAN.

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Remarks on some Starred Plants in the New Edition of the 'British Flora,' by Sir W. J. Hooker and Dr. G. A. Walker-Arnott. By
EDWIN LEES, Esq., F.L.S.

I QUITE agree with the observation in the Preface to the 'Phytologist' for 1850, that "Nothing can be more confused, contradictory and unsatisfactory, than the capricious decisions of our publishing botanists as regards the nativity of plants growing wild in Britain." I may add, too, that in many instances there appears to be no fair and just appreciation of evidence in the matter, and a judgment is given perhaps founded only on experience of a restricted district; or at any rate caprice is apparent when various plants are compared that bear the degrading mark of naturalization. Indeed, unless some rational rule be employed as an approximation to truth, I can see no use in using the asterisk or dagger at all: let every observer form his own opinion.

I have been led to think of this by an examination of the new edition of Hooker's 'British Flora.' Here I see *Anemone apennina*, *Adonis autumnalis*, *Corydalis lutea*, and *Aquilegia vulgaris*, all set down with the same starry mark denoting introduction. I take these almost-at-random classes of supposed interlopers. In *Adonis* we may admit an agrarian growing "amongst corn," or in manured land, and thus associated with cultivation; and we may see without doubt *Corydalis lutea* stealing out of the bounds of the garden, and adorning some adjacent wall or convenient bank. So as *Anemone appennina* is only found in a few spots, maintaining its position with difficulty, it may justly be considered of foreign origin; but how can the columbine be properly placed in the same category with it, growing as it does in hundreds of English woods and out-of-the-way places. Why a Herefordshire carter would enlighten a botanist as to the place where to find a wild columbine. But then it *must* have got out of some cottage-garden, for don't we always see it there with oxlips and daffydownillies? Yes, there they are, sure enough! Perhaps there is a raspberry-bush in the garden too, from whence those now seen in the adjacent woods may have taken their rise! But a poor observant poet I shall here show may beat a learned closet-botanist at a fact of eye-sight experience, for what says poor Clare, the Northamptonshire poet, anent the columbine?

"The columbines, stone-blue, or deep night-brown,
Their honeycomb-like blossoms hanging down,

Each cottage garden's fond adopted child,
Though heaths still claim them where they yet grow wild."*

For my own part, I have been accustomed to meet with the columbine in haunts far removed from public view, and in thickets distant enough even from cottage smoke; but it seems to be lost sight of by many persons how frequently the root of a pretty wild-flower is dug up from the place of its nativity and transplanted to a garden: this was done to a far greater extent formerly than it is now. Wordsworth testifies to the practice of the cottagers of Cumberland and Westmoreland.

" Brought from the woods, the honeysuckle twines
Around the porch, and seems in that trim place
A plant no longer wild; the cultur'd rose
There blossoms, strong in health, and will be soon
Roof-high; the wild pink crowns the garden wall,
And with the flowers are intermingled stones
Sparry and bright, rough scatterings of the hills."†

* I have frequently thought that the testimony of some of our rural poets, men with keenly-observant eyes, might in some cases be as good as a botanist's for the localities of plants, and not undeserving of record either. Take for instance the following from Drayton's 'Nymphidia':—

" And for the queen a fitting bow'r,
(Quoth he) is that fair cowslip-flow'r,
On Hipcut Hill that groweth;
In all your train there's not a fay
That ever went to gather May,
But she hath made it in her way
The tallest there that groweth."

This Hipcut Hill I presume is in Warwickshire, and perhaps Mr. Bree could tell us whether it is as famed for its oxlips now as it seems to have been in Drayton's time. Wordsworth in one of his poems has celebrated the daffodils of the Lake district, and their abundance, though I recollect no botanical record of the fact, perhaps from "wandering botanists" not being on the alert at the early season when the *Narcissus Pseudo-narcissus* appears.

" They stretched in never-ending line
Along the margin of a bay:
Ten thousand saw I at a glance,
Tossing their heads in sprightly dance."

Grahame in the homely strains of his 'Birds of Scotland' refers to the Herb Paris, and the habitats of other shrubs and flowers, in a pictorial way as adornments of the actual landscape. A considerable collection might be made out from various sources.

† 'Excursion,' p. 280.

It seems odd enough that while a decided woodland plant like the columbine is branded as introduced, no mark at all appears against the wall-flower (*Cheiranthus Cheiri*), which no botanist in this country ever affected to find except upon "old walls." Several other plants of walls and ruins, though evident immigrants at some former period, are allowed to pass muster with the oldest natives: thus the star becomes a mere capricious mark of opinion instead of conveying the knowledge of a decided fact.

I remember a remark made by some botanical writer' (I think Mr. Watson), that localities of plants once recorded need not be repeated; but it seems necessary to do so when elucidatory observations of value made in other publications are entirely lost sight of by the concocters of general floras, even in their latest amended editions. That a flora need not be cumbered with the localities of plants pretty generally distributed we may fairly allow; still false impressions should not be permitted to remain, and the range of remarkable plants given where possible. Now the woad (*Isatis tinctoria*) is an historical plant, interesting as having furnished the blue dye with which the ancient Britons painted or rubbed their naked bodies for terrific effect. It would seem likely that the woad was really a native in those early times to be generally employed as described, or the Britains might have cultivated it: any locality then suggestive of long occupation would seem highly curious. The only information given in the work of the learned authors alluded to is the old story of "cultivated fields about Ely, Durham, &c." An "&c." may be comprehensive or not, but the impression given to a student undoubtedly is, that the woad is confined to the eastern side of England, and only found casually in cultivated fields there. Now it grows abundantly in the chalk-pits of Surrey, whence I have specimens, and at a spot I am about to indicate in the west of England, where it has grown wild beyond the memory of man. Dyer mentions it in his 'Fleece' as if he considered it a native, and his observations on pastures and vegetables are generally very correct.

" Our valleys yield not, or but sparing yield
The dyer's gay materials. Only weld,
Or root of madder, here, or purple woad,
By which our naked ancestors obscur'd
Their hardy limbs, inwrought with mystic forms,
Like Egypt's obelisks."

Possibly the star may have been affixed to the woad in reliance on the opinion given by Mr. Watson in 'Cybele Britannica,' that the

Isatis tinctoria "can scarce be said to have acquired so permanent a possession of its localities as would justify its reference to the category of denizens. Localities may be found recorded in Botanical Guides; but in how many of such localities the plant itself would now be found, I cannot venture to say." It is a pity that a fact should not be established by inquiry instead of remaining in a state of uncertainty. The station of the precipitous face of the red marl cliff at the Mythe Tout, above Tewkesbury, where the Severn divides Worcestershire and Gloucestershire, appears in the list of plants I sent to the 'New Botanist's Guide,' as edited by Mr. Watson, several years ago, and large specimens were sent at a later period to the London Botanical Society. Why I think this locality very remarkable is, that the lofty marl cliff here is terminated southward by a tumulus or mount of worship, dedicated of old, as its name implies, to the idol Teutates. Now as a boy I became acquainted with the woad on the marl cliff without knowing its botanical name prior to 1818, as occurring year after year. Here again, from proximity of residence, I was enabled to observe it in splendour of flowering each year from 1836 to 1841, and on my information Mr. Thomas Westcombe, of Worcester, has gathered it at the Mythe Tout since that time, when it was very abundant, and there a relative tells me it still was last year. There is no recollection of the woad ever having been cultivated about Tewkesbury, and on the marl cliff, where it grows, extensive pastures only appear on either side of the river and on the summit of the cliff. This then would seem an undeniable place of wild growth, unless it be supposed possible that it is a lingerer from Celtic cultivation. In France the woad appears to be considered a native without any doubt.

The soapwort (*Saponaria officinalis*), certainly but little used at present officinally, although having the brand, and said to be found "especially near cottages," might surely have been allowed to pass muster with the red currant (*Ribes rubrum*) and gooseberry (*R. grossularia*), which are lucky enough to escape with the mild remark of "scarcely indigenous." This star in one very dubious case, and the omission in others, yet with the "scarcely," leaves matters in a very unsatisfactory way. Currants and gooseberries it must be admitted are rarely found except as individual stragglers, mostly about brooks and water-courses, but the soapwort extends itself in truly wild localities for long distances. It occurs in numerous patches on the banks of the Severn, and in profusion on the side of the gravelly Usk, near Crickhowel, in Breconshire. I have several times met with it, too, in bushy places in the midst of woods. It seems to be forgotten

that a plant once used for rustic services, and therefore an attendant about cottage hedges, may also be aboriginal to the country.

I must try to rescue another plant, rather a favourite of mine, from the stars and stripes of bondage, and claim its freedom as a native-born Briton. This is the *Sedum album*, which I think appears with the brand for the first time. That it may in general be seen the captive of walls, and even chained like a domesticated pet upon roofs, may be true enough, but I shall contend for its being born free. Who will accompany me at this misty time to the slippery dripping rocks of the North Hill, at Malvern, dark with the purple *Parmelia* or the leather-like *Umbilicaria*? Higher up, beyond those deep-green, rigid, yet close-shorn, gorse-bushes and withered brakes, away from any path except the narrow track of the sheep, there upon mouldy ledges, with difficulty reached, and among fleshy leaves of the *Cotyledon*, nestles in little trailing tufts, with its turgid red leaves, the *Sedum* we are in quest of. And upon those bold lichened rocks hath been its seat time out of mind. Oh! but—some

“Hermit good, who lived in that wood,”

probably St. Werstan, whose martyrdom appears in the stained abbey-windows below, was kind enough to plant the *Sedum album* here for the benefit of botanists! Among the flowers surrounding his figure in the stained lights, something like gorse, fern, foxgloves, and primroses really do appear, and as in this primitive flora the *Sedum* is not evidently visible, what can we infer but that some monk must have planted the little *Sedum*? When the *Sedum album* was first recorded as growing on the Malvern rocks I am unable to say, but it appears in the second edition of *Withering*, published in the last century, on the authority of Dr. Stokes, who edited that issue, and Mr. Ballard, a surgeon, of Hanley Castle. Mr. Watson in his ‘*Cybele*,’ though my ‘*Botany of the Malvern Hills*’ might have been quoted for the fact, leaves the matter as if *sub judice*, and puts the question, “Is *S. album* a native upon the Malvern rocks?” Only a resident of the vicinity is properly qualified to answer. It has most certainly every appearance of being indigenous upon the precipitous rocks I have noted, which are away from any path, where no even hermit’s garden could have ever been, and at an elevation of about eight hundred feet. Below these rocks the plant never occurs, nor have I, in an experience of Malvern of more than thirty years, ever seen the *Sedum album* on walls of gardens about the village or town, as it has now become. Mr. Borrer has stated that the Malvern *Sedum* is *S. teretifolia* of

Haworth, but whether more is meant by that than the one being a synonym of the other, I am unable to say. The Malvern *Sedum album* only flowers in very hot seasons, and I have only gathered it twice in that state. Mr. Thomas Westcombe, of Worcester, a very careful investigator of our native plants, tells me that in his garden he has cultivated the Malvern *Sedum* for many years without once inducing a flower to appear, and I have often had it flourishing for a long time in a pot in the same predicament. Mr. Westcombe further says that the plant is very similar to, and indeed scarcely distinguishable from, a *Sedum* he received from Montreal, in Canada, under the name of *S. Monsregilense*, and which in like manner has never flowered with him under cultivation. If it is thought unlikely that the Malvern rocks should nourish a *Sedum* not found certainly wild elsewhere in Britain, parallel cases might be adduced with the *Cotoneaster* at the Orme's Head, *Potentilla rupestris* on Craig Brithen, and *Dianthus cæsius* on the Cheddar cliffs.

Although I think I might justly object to the appearance of the star as shedding but little light in several other instances, I shall now confine myself to the notice of the poplars, three of which are struck off the roll of our native trees, and put under its baneful influence. We may however properly consider the white poplar as made up of two varieties, *alba* and *canescens*, for I am unable to distinguish the two specifically. Sir J. E. Smith lays some stress upon the stigmas being four in the former and eight in the latter, but in fact even in *P. alba* they are difficult to distinguish as four only, their extremities being more or less divided, and thus they appear as six, seven, or eight, according to the greater or less divarication of the lobe. The palmate root-leaves, densely downy and white beneath, seem nearly the same in both varieties, and little remains to distinguish them but the wood, reported as much "firmer" in *canescens* than in *alba*, arising probably merely from the drier ground in which *canescens* usually grows. Selby however remarks in his 'British Forest Trees' that "if they are only varieties of one species, the original stock is more likely to be the *Populus canescens* than the *P. alba*, the first appearing to have a wider geographical distribution, and to be more generally met with in a wild and indigenous state, than the latter."* Principally in the form of *P. canescens*, I have observed the white poplar widely distributed, especially on the margins of streams towards their sources in the hills, where its lofty, smooth stem and gray

* Selby's 'History of British Forest Trees,' 8vo, p. 176.

bark give a peculiar feature to such upland spots, while the boisterous stream makes its everlasting cry among the dark pebbles that encumber its bed beneath the rude and tottering foot-bridge. Dr. Bromfield has suggested that the aspen (*Populus tremula*) is the only poplar of those reputed British, that "occurs in the middle of our large woods remote from the inclosed country." It is true enough that the aspen is common enough in a small form in almost every extensive wood. But we must look to the peculiar character of the gray and white poplars. They are not trees of the forest, but delight to form societies of their own on the banks of streams or on the margin of marshy heaths. Here they appear as Nature intended them, giving a characteristic feature to the barren, sloppy flats, that have scarcely any other trees to countenance them but scraggy, stunted and fissured willows; and when the autumnal breeze blusters among their silvery leaves what a pleasing effect is produced before the eye of the lone wanderer in such places. I find the gray poplar scattered more or less on all our moist Worcestershire heaths, and abundant in several yet uncultivated parts of Malvern Chace, for even if cut down occasionally, suckers from the roots quickly overspread the ground, forming a young shrubbery, and bearing monstrous leaves, excessively white beneath. As far as I have noticed, the white and gray poplars are not common in Wales, but I have notes of *C. canescens* as occurring at Pelcombe, near Haverfordwest, and near Cannington Bridge, Pembrokeshire.

With respect to the black poplar (*P. nigra*), surely its wide distribution throughout Britain, as remarked by Selby, is "strongly in favour of its being indigenous." Indeed, except from the fact that black Italian poplars are now generally planted in shrubberies, I can conceive no solid reason for blackening the character of *P. nigra*. Nothing is more common on the winding woody banks of our roving and bubbling Worcestershire brooks than old, tortuous, cracky trees of the black-poplar, with grotesque pollarded heads, that look like demons against the evening sky, with the furrows of hundreds of wintry storms upon their sides. Far more enduring than the willows, beside which they meditate, they remain firm amidst the catastrophes that so often upset the disembowelled trunks of those fragile trees, and really form some of our noblest dryadean inhabitants by watery places. I have noticed some twenty feet in circumference, and on the banks of the Severn at the Lower Lode, near Tewkesbury, is a grove of very old black poplars, so lofty that a rookery has been located in them beyond the recollection of anyone now living. It is remarkable

that almost everywhere in Worcestershire and Gloucestershire where the Italian black poplar is planted, that in a few years the boughs of the trees become loaded with mistletoe, far more so indeed than upon apple-trees, upon which it is common enough in this county and Herefordshire. Yet strange to say, on the native *Populus nigra*, though I have examined every tree I came near for a long time, yet I have never observed the mistletoe growing there in a single instance.

But I have perhaps strayed a little from the point I commenced this paper with, the *stars*, that might as well be put out as permitted to shine! Surely it is capricious and inconsistent to put the same mark against a columbine, a medlar, and a turnip, and pass over the wall-flower and *Arabis turrita* without any mark at all. There is also a great want of exactness in making a similar character positive in one case, as in the common elm, and only interrogatory in another, as *Populus canescens* and *nigra*, which doubtfully are said to be "scarcely indigenous." I think Dr. Bromfield's double dagger (‡) might well be employed to stab plants the certain derivatives of a garden, while a single dagger (†) might be given to those known as introduced, but naturalized for a long time, as *Teucrium Chamædrys*, *Linaria Cymbalaria*, &c. Some very dubious cases might be starred, but not against evidence, as in the cases of the columbine and *Sedum album*.

In a descriptive flora intended for students and neophytes, who of course want information on all specimens they may find, I really think that such plants as *Lilium Martagon*, *Maianthemum bifolium*, *Narcissus incomparabilis*, and many others apparently naturalized in Britain, ought not to be slurred over undescribed, under the plea that the author or authors do not believe them to be indigenous, or that they have "no right to be admitted into our flora." What in fact gives the right, but the occurrence of the plant, and if it does occur, come from where it may it ought to be catalogued and described. In the case of the *Anacharis alsinastrum*, though probably enough originally an American plant, this is allowed without any demur. Where indeed should the line be drawn? Surely occurring plants deserve commemoration. In one place the authors of the 'British Flora' assert that our plants are all derived from the continent, which, if the European continent be meant, requires some qualification. But allowing this for a great portion of our flora, let us take *Tulipa sylvestris* for instance, an inhabitant mostly of chalk-pits and quarries (and which, by the bye, has no star), and considering it as an introduction, on what principle is that to be considered to have a right to

a place in our native flora, while *Eranthis hyemalis*, *Petasites fragrans*, *Melissa officinalis*, *Atriplex hortensis*, *Rumex scutatus*, &c., as well as those before mentioned, some of which are as much established as the *Tulipa*, are designated as having "no claim" to be enumerated in a British flora. Some of the above are really in more natural positions than *Petroselinum sativum*, which appears without scruple, though scarcely of older date upon old walls.

These observations are not made with the slightest view of carping unfairly at the labours of learned botanists, but are thrown out as tendrils of thought, or little burs of reflection, under the hope that some better general understanding may be come to as to marks of introduction and naturalization, which are at present altogether incongruous and conflicting, productive indeed rather of vexation than information.

EDWIN LEES.

Cedar Terrace, Henwick, Worcester,
February 8, 1851.

Botanical Notes for 1851.

By GEORGE STACEY GIBSON, Esq., F.L.S.

HAVING spent a short time last summer at Durroon, a small but beautifully-situated watering-place on the west coast of Scotland, much frequented by residents at Glasgow and the neighbourhood, I enclose a list of some of the rarer plants met with, as I do not remember having seen any notice of this district in the 'Phytologist.' It is not by any means particularly rich, but there are a good many bog plants, with some maritime and mountain species.

Of the former, *viz.*, the bog or marshy-ground plants, one of the commonest is *Carum verticillatum*, which is more plentiful than any other umbelliferous plant, and met with in all such localities. *Malaxis paludosa* is found rather sparingly on the spongy sides of the hills, but may easily be overlooked from its small size and inconspicuous colour; it is accompanied in greater quantity by *Pinguicula lusitana*. *Osmunda regalis* is not uncommon in moist woods. *Oxyria reniformis* grows by the sides of mountain rills. Besides these, may be enumerated *Ceanothe crocata*, *Helosciadium inundatum*, *Habenaria bifolia* and *chlorantha*, *Crepis paludosa*, *Comarum palustre*, *Narthecium ossifragum*, *Hypericum dubium*, *Saxifraga aizoides*,

Menyanthes trifoliata, *Carex pulicaris*, *distans* and *pallescens*, *Hippuris vulgaris*, *Viola palustris*, *Lycopus europæus*, *Veronica scutellata*, &c. *Mimulus luteus* grows abundantly in a moist meadow, where it is completely naturalized.

Among the maritime plants may be noticed *Erythræa linariifolia*, *Blysmus rufus*, *Schlerochloa maritima*, all abundant on the salt-marsh banks of the Holy Loch, with the commoner species, *Salicornia herbacea*, *Glaux maritima*, *Aster Tripolium*, *Scirpus maritimus*, &c.

Of the mountain species, *Salix herbacea* and *Thalictrum alpinum* grow near the top of the Bishop's Seat; *Saxifraga stellaris*, *Asplenium viride*, *Cystopteris fragilis*, &c., in a gorge near the same hill. *Polypodium Phegopteris* and *Dryopteris* are not uncommon, also *Lycopodium Selago* and *selaginoides*. *Hypericum Androsæmum* is found in woods, and *Hymenophyllum Wilsoni* grows on a wall in a shady lane.

A longer stay might have enabled me to enlarge this list, but the locality is a limited one, and the soil and situations rather similar.

The neighbourhood of Blair Athol is doubtless a very rich one, and in a ramble of a few hours there I met with the following species:—*Polygonum viviparum*, *Rumex aquaticus*, *Geranium sylvaticum*, *Galium boreale*, *Astragalus hypoglottis*, *Trollius europæus*, *Habenaria albida*, *Carduus heterophyllus*, *Hieracium Lapeyrousii* or *cerinthoides*, *Viola lutea*, *Galeopsis versicolor*, *Lycopodium alpinum*, *Equisetum sylvaticum*, &c.

Last year I expressed a doubt respecting *Fumaria parviflora* having been found in this country. This doubt has been since entirely removed, by my meeting with it and *F. Vaillantii* growing together in a field at Settlebury, near this town, in considerable plenty, and bearing marks of being distinct species. Probably they may not be uncommon, as I have also found them separately in other places in this district. Their specific characters are detailed by A. Henfrey, the most prominent of which are, that in *parviflora* the leaves are in narrow capillary segments, yellow glaucous-green; the flowers are white, tipped with dark, and fading off purple; the habit is bushy and upright. In *Vaillantii* the leaves have broader segments, are of a bluish, darker green, often tinged with purple; the flowers are purplish, never white, but fading to somewhat of that colour; the habit is spreading and diffuse. This, too, appears to be an earlier-flowering species, scarcely any trace of it remaining in the autumn, while *parviflora* was still flowering freely. The seeds appear similar. I have not seen any intermediate forms; indeed, *Vaillantii* seems more intermediate between *parviflora* and *officinalis* than allied

to either. The figures of them in 'English Botany' are pretty good representations, but *parviflora* is figured from a young and undeveloped specimen.

My friend J. Clarke noticed a *Carduus* this summer of a rather peculiar appearance, corresponding in most respects to *acanthoides*, but differing in its much larger flowers, and broad involucreal scales, which are often coloured, and nearly resemble some small specimens of *nutans*. It is found in several different places by road-sides. The description which Sir J. E. Smith gives of *C. crispus* corresponds with it, which he says had not then been found in Britain; but the flowers are not clustered, as stated in Babington's 'Manual:' perhaps Smith's *crispus* is his *acanthoides*, &c., and Smith's *acanthoides* his *β. crispus*, which he says is the more common. Koch treats them as distinct species, but it is almost impossible to find any characters in his descriptions of them. Though probably only a variety of *acanthoides*, it deserves further attention.

Poterium muricatum has been gathered again here this year in one of its former localities, and also on the railway banks plentifully; it seems to grow on richer ground than *Sanguisorba*, of which some think it only a variety, caused by difference of situation, the muricated character of the seeds not being always equally apparent, and it is difficult to distinguish by other peculiarities. I do not give this as my opinion, but think that it may be considered an open question.

Melilotus arvensis does not seem to be confined to the south of England, as I gathered it on a ballast-hill near South Shields, with *M. officinalis* and *vulgaris*, *Silene noctiflora*, and *Senecio viscosus*.

The genus *Arctium* claimed my notice last autumn, but I have not been able to arrive at any satisfactory conclusion upon it. We have here three forms, answering, I believe, to those described by one or more foreign authors as *major*, *minor* and *intermedium*, which in their extreme forms appear distinct, but in others are not easy to distinguish; they are all common, the first generally in moist ground, the second in shady places, and the third by road-sides, &c., though they are sometimes all found together. The chief differences are in the size, shape and colour of the flower, the position of the involucreal scales, and the amount of web. Most authors admit two species, but there is considerable difference of sentiment even on this point. The figures in 'English Botany' are greatly confused; the one represented there as *tomentosa* being what I suppose to be *intermedium*; the *Lappa* being *minor*; and the true *major*, answering to the *Lappa* of most English authors, not being figured at all. *Major* or *Lappa*,

and minor or bardana, are very different in appearance, but are so closely connected by forms of intermedium, that it is difficult to say to which some specimens should be referred, and I am inclined to think a threefold division of the genus may be more correct than a twofold, while perhaps the real truth will be that they will all prove to be forms of the same species, but I am not yet prepared fully to admit this view of the subject. If the attention of botanists in different places is called to it, a more satisfactory solution of the difficulty may be arrived at.

G. S. GIBSON.

Saffron Walden,
February 10, 1851.

Remarks on the Spirilla or Spermatozoides of Mosses.

By W. WILSON, Esq.

MORE than a year ago I commenced in earnest my observations of these very singular bodies, whose active movements when just at maturity caused me long ago to overlook them as animalcules, which had intruded themselves into the antheridia. They are well worth the study of every possessor of a good microscope. The representation of their form given in Lindley's 'Vegetable Kingdom,' and indeed in all the works I have yet seen, not excepting Dr. W. P. Schimper's excellent 'Recherches Anatomiques et Morphologiques Sur les Mousse,' is unsatisfactory. The shape and size of the spirilla are both variable in different species of moss, but not so much so as to justify the published figures. The best examples are found in all the species of Sphagnum, where the massive portion of the spirillum is truly sausage-shaped, not gradually tapering into a spirally-folded tail; the tail itself being attached to the back and not at one end of the body, and about five or six times as long when drawn out, forming a helix of one turn and a half or rather more, while the spirillum is in active motion, and immersed in fluid. On drying, the spiral fibre is uncoiled, and assumes various forms. In the antheridia of Polytrichum the spirilla are confined, up to a late period, in the cavities of cellular tissue, each cellule containing a single spirillum, whose gyrations are (while still in confinement) even more rapid and energetic than those of Sphagnum. These bodies have been seen in the antheridia of Splachnum, of various Hypna, and indeed in so many other genera of mosses, that there is good reason to conclude that they exist universally

in the tribe, and that they also occur in the Hepaticæ. *Mnium hornum*, common on sandy banks, affords a good example for observation about this time of the year; but it is necessary to observe that the antheridia must be watched, and taken at the proper moment, in order to obtain results which shall be perfectly satisfactory. They continue in perfection for some days when confined in a tin box, but probably burst more speedily in a growing state. It would seem that the motions of the spirilla, both as to kind and intensity, are very much influenced by the degree of maturity of the anther under examination. In an early stage, only a few of the spirilla among the general mass show signs of activity, and their movements are comparatively languid and fitful. In a perfect state the spirillum acquires both a rotatory and a progressive motion, both motions, however, resulting from one and the same impetus. In a less complete state the motion of the spirillum is either gyration on a fixed axis or one combined with an irregular oscillatory movement, more or less rapid, varying from two to ten or more gyrations in a second. The normal movement, however, is in the direction of the spiral fibre, which screws itself along through the fluid, often in a perfectly straight course, dragging after it the sausage-shaped body; the progressive motion being often so quiet as to render it difficult to follow it.

There has of late been a strong tendency to refer such movements to some principle not distinguishable from that of animal life, but it appears to me that they can be sufficiently accounted for on more simple grounds. Were the spirilla really possessed of life, one might expect them, at any rate, to follow the usual rule, and to go head first, but these always move as if the spiral fibre were propelled by a *vis à tergo*, and indeed the spiral fibre may be designed for the special purpose of modifying the direction of the impetus from behind. It is quite legitimate to assume that at the time of maturity the sausage-shaped body is a membranous sac, filled with dense mucilaginous matter, and that by the action of endosmose the bulk of the contained mass is increased until a supply for a continuous jet, from a small pore at or near the back of the body, and nearly in the direction of the axis of the spiral fibre, has been produced. Such a jet would certainly account for the movements, and is in perfect harmony with what I have seen; for I believe I have several times seen the jet itself, but on this point I am willing to wait for further and more decisive evidence. The possessors of better and more powerful microscopes than mine are requested to pursue the subject.

As to the function of the spirilla, I believe it will be found in

proportion to our acquired knowledge of mosses that they are as essentially connected with fecundation as the pollen of phenogamous plants, of which they are the analogues. Many very interesting examples of the infertility of certain mosses, especially of *Hypna*, have been satisfactorily accounted for by the fact that such species are dioicous, and that the simultaneous occurrence of plants of both kinds is very uncommon, as to those species. On the other hand, fruit is never developed unless anther-bearing plants are present. In the locomotive properties of the spirilla we find the refutation of one of the chief arguments against the fecundation of mosses; for the diffusion of these bodies during rain must be both rapid and extensive, quite sufficient to insure access to the fertile flower.

W. WILSON.

Warrington, February 11, 1851.

Note on Mr. Quekett's Monstrous Moss.

By W. WILSON, Esq.

NOT having yet seen Mr. Quekett's remarks in the original publication, I confine this note to what is said on the subject in Lindley's 'Vegetable Kingdom,' article *Bryaceæ*, where it is stated that a mass of *Tortula fallax*, having young setæ capped with calyptræ, had undergone a very remarkable change after having been grown in a Ward's-case, the tendency to produce fruit having been checked, and "instead of fruit a miniature forest of elevated stems, leafy above and below, but in the intermediate portion destitute of leaves;" in fact, a complete suppression of fruit, and a conversion of those parts into leafy shoots, is assumed to have been the result of the experiment.

The 'Doctrines of Morphology' are supported by so many analogies that few persons will question the propriety of regarding the calyptra of a moss as one of the last convolute leaves of the axis: so far, however, as the fact is made to depend on Mr. Quekett's experiment, there is reason to dispute it. An illustrative specimen from Mr. Quekett has been in my possession for several years. When properly examined, apart from the influence of hypothesis, it presents nothing remarkable, and certainly nothing anomalous. It is not a *Tortula*, but a very common moss, found upon every wall, called *Ceratodon purpureus*. After due examination of the specimen, I can assert, without the least hesitation, that there is absolutely no evidence

of conversion of a young seta into a partially leafy stem. The supposed proof of such a conversion is what is well known by every practised bryologist to be a phenomenon of universal occurrence whenever a moss is removed from a free, dry atmosphere, to one that is confined very and humid. It is still more observable when the moss is shut up in the dark. Indeed, it is nothing more than what is called *etiölation*, and as a consequence of such treatment, the young branches or innovations in Mr. Quekett's specimens, which would in ordinary circumstances have been very short, and only developed at a later period, have been suddenly drawn up and attenuated until the branch and the definite number of cellules composing it have been elongated several times their usual length. Of course such a stimulus to luxuriant growth of the stem must operate as a check to the growth of the fructification, and it is generally observable that in such cases the fruit is abortive. This happens in an unusually wet season to most mosses, without the intervention of a Ward's-case.

W. WILSON.

Warrington, February 11, 1851.

On a Supposed New British Species of Adiantum.

By W. WILSON, Esq.

I SEND full-grown fronds of an *Adiantum* from roots which have been in cultivation upwards of ten years, and which were gathered in the Isle of Man, by my friend Mr. T. G. Rylands. It differs very considerably in appearance from the ordinary form of *A. Capillus-Veneris*, and may perhaps be a different species. If compared with the figure in 'English Botany,' it will be seen that the frond is narrow and oblong, by no means flabelliform, and the branches instead of being set at an acute angle, are widely spreading. The pinnules do not taper gradually into the foot-stalk, and seem to be of quite a different shape from those of the Arran specimen. The characters presented by the fronds sent are constant in the plants under cultivation. I may here mention, that when I received the roots they were hastily planted in a common garden-pot, and were afterwards much neglected, until I thought they had quite perished for want of water. If they had not been more than usually tenacious of life such would have been their fate; but by careful nursing they were saved, and have ever since grown vigorously in a greenhouse, without artificial tempe-

rature during the winter. At the time when the roots were first gathered, the fronds were very small and imperfect.

W. WILSON.

Warrington, February 8, 1851.

[I have long had this subject under consideration, and shall have something to say about it next month.—*E. N.*]

Remarkably Fine Specimen of the Edible Chestnut (Castanea vesca).

By H. L. DE LA CHAUMETTE, Esq.

THE finest specimen of this beautiful tree I have as yet seen stands at about half an hour's walk up the neighbouring mountain from the town of Evian, in Savoy. The steamer was making a "promenade" on the second of August, 1846, to Evian, leaving passengers there in the morning, at about 10 o'clock, and coming to fetch them home at about 5 P.M. I made this "promenade" on this day to the above-mentioned town, which is very dirty and dull, as are most of the towns in Savoy, and went with a guide on purpose to see the famous chestnut-tree. I went through a narrow path with a broken wall on either side, covered with the fronds of *Polypodium vulgare*, which, being then quite matured, had a very pretty appearance. Presently we got into a forest of nothing but noble chestnut-trees; the foliage was so thick that the beams of the sun could scarcely penetrate it, and the ground we were walking on was so slippery with *Lycopodium*, *Sphagnum* and *Musci*, that it was troublesome walking. At last we came into a field bordered with these splendid trees, and at one corner stood the specimen I have much pleasure in giving a short account of. I measured the circumference of its trunk, and found it to be fifty-four feet. The trunk was perfectly hollow, and yet sound to all outward appearance. I got inside, and am sure it would shelter eight persons comfortably. The height of the tree is very great, I am told upwards of eighty-five feet, and it is spreading and well-shaped in proportion to its gigantic size. If any botanists visit Evian I hope they will pay this tree a visit, and judge for themselves of its beauty and that of the scenery around.

H. L. DE LA CHAUMETTE.

Stoke Newington, February 10, 1851.

Note on Lastrea uliginosa. By MR. JOSEPH BRAY.

As you have expressed a wish to receive communications respecting *Lastrea uliginosa*, I beg to offer the following statement of facts to the notice of the readers of the 'Phytologist,' leaving them to draw what conclusions they may think proper from them.

In September last I saw, for the first time, a plant of *Lastrea uliginosa*. Shortly afterwards a gentleman showed me a plant which he had procured from a nursery, under the name of *Aspidium spinulosum*. This plant I immediately recognized as being identical with the one before mentioned. Being anxious to possess *L. uliginosa*, I went to the nursery, and out of an extensive collection of British ferns I was, with the greatest ease, enabled to select four plants of it, which were mixed with *cristata* and *spinosa*. These plants I showed to Mr. Lloyd, and he said that they were quite correct: he gave me the following account as to how they came into the possession of the party from whom I procured them:—He informed me that when he brought *Lastrea cristata* from Nottinghamshire, he supplied the same party with living plants, and that shortly afterwards he received a communication that some of them were not correct, in consequence of which he sent others to the number complained of, but neglected or did not think it worth the trouble to withdraw the first plants supplied. His own plants, being in a north border, had not then expanded their fronds, whilst these, being potted and protected, were much earlier, but as he did not examine them, and had no idea that they were anything more than *Lastrea spinosa*, he left them. I do not profess to be a scientific botanist, and therefore am not competent to give an opinion whether it is a species or a variety, but I beg to observe that I can, by its habit, distinguish a well-developed plant of it from either *L. cristata* or *L. spinosa*, but certainly with much greater ease from the latter than from the former.

JOSEPH BRAY.

February, 1851.

Notice of the 'Botanical Gazette,' No. 26, February, 1851.

THIS number contains two original papers, intituled as below.

'On *Euphorbia stricta* and *platyphylla*;' by Fenton J. A. Hort.

'Remarks on some of the British *Carices*;' by John M'Laren.

In the first of these Mr. Hort contends that the two spurges known under the names *stricta* and *platyphylla* are specifically distinct, in opposition to the view lately advocated in the sixth edition of the 'British Flora,' where the learned authors apparently consider them as constituting but one species. The examples of *platyphylla* examined by Mr. Hort were well adapted for that purpose, being of unusual luxuriance, two feet or more in height. The distinguishing characters, apparently drawn up with the most praiseworthy care, are as under:—

“In *E. platyphylla* the very large, spreading, terminal umbel consists of from three to five rays, which divide into from two to three secondary rays; these again being repeatedly, as often as five times in the larger specimens, bifid. The leaves and general bracts are elongate-obovate, broadest above the middle, gradually narrowed to the cordate, sessile, but not amplexicaul base, often shallowly plicate just above the base; the first partial bracts rhomboid-ovate, obtuse, apiculate; the other bracts rhomboid- or triangular-orbicular, rotundate, above apiculate; all cordate. The involucre, which are slightly bristly, contain seven or eight male flowers: their glands are oval. The capsules are covered with irregular, mostly conical tubercles, which shrink much, and become ‘depressed’ when dry; while in a young state they bear a few bristles. The grayish brown seeds are roundish, obovate, indeed almost globular when the testa is removed; the funiculus is an oblong mass, having two slight protuberances on the side adjoining the placenta, with a deep notch between them. Stem erect, single, sometimes throwing out axillary branches.

“In *E. stricta* the terminal umbel consists of from three to five rays, each of which forms from three to five bifid secondary rays; but I have never seen any further subdivision, even on the most luxuriant plants.” The contrast here set up by Mr. Hort does not seem to me perfectly satisfactory. I think the very luxuriant plants of *platyphylla* may exhibit the subdivision of which he speaks, but on a comparison of smaller specimens with Tintern plants of a similar magnitude the discrepancy is scarcely perceptible. I believe I had the pleasure of first calling the attention of botanists to the very striking spurge which is so abundant at Tintern, and the scarcely apparent discrepancy in the division of the umbel was not at that time considered of importance. The seed, I think, if Mr. Hort’s characters prove constant, will form a safer guide. “The lower leaves are elongate-obovate, and broadest above the middle; the upper elongate-oblong, and broadest about the middle; all gradually narrowed to the cordate,

sessile, but not amplexicaul base, slightly saccate or shallowly plicate just above the base; * * * the general bracts are as the upper leaves; the first partial bracts are more lanceolate, being generally broadest rather below the middle; the other bracts broadly cordate, obtuse, with a minute apiculus. The involucre contains one or two, hardly ever three, male flowers: their usually oval glands bear a few bristles on the under side. The capsules are covered with subcylindrical tubercles, which shrink so little, that they retain their shape tolerably when dry. The reddish brown seeds are oval, obovate, and, when the testa is removed, appear almost pyriform: the funiculus is externally somewhat like an inverted basin divided vertically, attached to the placenta by the edges of its divaricating walls, leaving a broad notch between them, in the interior of which is the process to which the hilum of the seed is attached."

This beautiful plant is extremely local, being confined to the vicinity of Tintern and the Wynd Cliff, and to "a spur projecting from the strip of limestone which flanks the forest of Dean to the west." In the Wynd-Cliff locality the soil seems to contain its seeds in such abundance that it makes its appearance in the most unlooked-for stations. I recollect remarking one that seemed extraordinary for so conspicuous a plant. The road under Wynd Cliff having been repaired with a tolerably thick layer of broken stones, the few wheeled vehicles that pass that way avoided the rough ground as much as practicable; and some two or three dozen plants had grown up among the stones, almost in the middle of the road.

Of Mr. M'Laren's paper on the *Carices* a copious abstract has already appeared, and I presume we shall have it again in the 'Transactions of the Botanical Society of Edinburgh.' I confess I do not like this plan of making one pay so many times for the same information; but I presume the cause of the introduction of Mr. M'Laren's paper into the 'Botanical Gazette' is the "botanical famine" to which I alluded last month. Mr. M'Laren describes seventeen species, as under:—

1. *C. teretiuscula*, *Gooden.*, &c.
2. *C. paniculata*, *Linn.*, &c. Of this species *C. paradoxa* of Schkuhr is given as a variety.
3. *C. vulpina*, *Linn.*, &c.
4. *C. muricata*, *Linn.*, &c., of which *C. divulsa* of Wahlenberg, &c., is given as a variety.
5. *C. axillaris*, *Gooden.*, &c., of which *C. Bœnninghausiana* of Wiehe and *C. Hailstoni* of Gibson are given as one variety.

6. *C. remota*, *Linn.*, &c.
7. *C. saxatalis*, *Linn.*, *C. pulla*, *Gooden.*, of which *C. Grahmi* of Boott is given as a variety.
8. *C. rigida*, *Gooden.*, *C. saxatalis*, *Wahl.*
9. *C. vulgaris*, *Fr.*, of which *C. Gibsoni* of Babington is given as a variety.
10. *C. acuta*, *Linn.*, &c.
11. *C. aquatilis*, *Wahl.*, &c.
12. *C. stricta*, *Gooden.*, &c., *C. cæspitosa*, *Hudson*, &c.
13. *C. extensa*, *Gooden.*
14. *C. flava*, *Linn.*, &c.
15. *C. distans*, *Linn.*, &c., of which *C. fulva* of Goodenough, &c., is given as a variety.
16. *C. binervis*, *Smith*, &c.
17. *C. vaginata*, *Tausch*, &c.

In reducing the number of supposed species many botanists will very cordially concur, and will also perceive that the author has been in several instances anticipated in his conclusions by Dr. Bromfield in his admirable commentary on these plants published in the 'Phytologist,' and more recently by Hooker and Arnott in the sixth edition of the 'British Flora.'

Literature :—'Flore de France,' par MM. Grenier et Godron, Tome 2, Partie 1me. To this work and its matchless labours on the genus *Hieracium* I shall have occasion again to allude. Mr. Henfrey speaks of this portion of the work with the praise it merits. 'Annals of Natural History,' 'Hooker's Journal of Botany,' 'The Phytologist,' 'Annales des Sciences Naturelles.'

Notice of 'Hooker's Journal of Botany and Kew Garden Miscellany,'
No. 26, February, 1851.

The number contains the following papers :—

'Contributions to the Botany of Western India; by N. A. Danzell, Esq., M.A.'

'Decades of Fungi; by the Rev. M. J. Berkeley, M.A., F.L.S. Decades 32 and 33. Sikkim-Himalayan Fungi, collected by Dr. Hooker.'

'Catalogue of Cryptogamic Plants collected by Professor W. Jame-son in the vicinity of Quito; by William Mitten.'

‘Note on *Platynema*; by G. N. [? A.] Walker-Arnott, LL.D., Professor of Botany, Glasgow.’

Botanical Information:—*Cedron*, previously published in the ‘Port of Spain Gazette.’ Dr. Link, a notice of his death, extracted from the ‘Literary Gazette.’ Linnean Society.

Notices of Books:—‘Description of the *Palmyra Palm* of Ceylon; by William Ferguson. Colombo, 1850.’

Of the original papers, however valuable for reference and comparison of species, I can give no abstract here, seeing that they relate entirely to exotic, and for the most part obscure, portions of the vegetable kingdom. The following particulars of the *Cedron* are, however, more interesting; but the learned editor should have favoured us with the name of the plant, and of the natural order to which it belongs. These can be no matters of doubt, since it appears that specimens are growing in the Royal Gardens at Kew.

“During my travels in New Granada,” says Mr. Purdie, “I had often heard of the virtues of the *Cedron*, long before I had the pleasure of meeting with the tree. It is rare to find a *Peon* or *Ariero* without a seed, although they are expensive. I have, myself, paid a dollar a seed at San Pablo, where the tree is indigenous, even within the precincts of the village. Its use is not confined to the cure of serpent-bites alone, but has the reputation of superseding sulphate of quinine in cases of fever, and that in the country of the *Cinchona* barks.

“Now about eight years ago, the Government of New Granada sent a commission of several medical men and students, accompanied by Dr. Cespides (Professor of Botany in the University of Bogota), to ascertain what plant produced the *Cedron*, its locality, and quantity procurable. You now see it in all the apothecaries’ shops in the different towns of that Republic; so that now, in the midst of forests of the Peruvian Bark tree, another remedy at least equally specific (and that without any chemical preparation) is in process of superseding it. During my stay in Bogota, I was informed of the locality of the *Cedron* (by Dr. Cespides, a gentleman of considerable knowledge and experience in the plants of New Granada), which I found would be on my route from the province of Antioguia, by way of the Rio Magdalena. Thus, Providence has decreed, that out of the alluvial and pestilential plains of this magnificent river, a remedy should come for the cure of its own maladies. On my reaching the village of Nari, in the great valley of the Magdalena, in August, 1846, I found that the surrounding woods contained the celebrated *Cedron*, as also

lower down the rider at San Pablo. I was glad to find that it was the season of its having ripe fruit. The villagers had already collected each their little hoard of Cedron, although they would not show me more than a few seeds, unless I would purchase some. The mode of preparation is simple and easy : the fruits are gathered, which resemble in appearance a large peach ; the outer rind or covering is thick, fleshy, and excessively bitter, and its large seed is immediately surrounded by a not very compact fibrous substance, which answers the purpose of the stone in stone-fruits ; this is all removed, and the seed taken out, separated into two pieces at the natural fissure (which are called by botanists the cotyledons), and dried in the sun ; beyond a limited quantity of these, it was no object to me to obtain ; what I particularly wanted was a knowledge of the tree, and ripe vegetating seeds : those dried in the sun will never vegetate. I was told that it would be useless for me to go to the woods, as the trees had already been pillaged in all directions ; this, however, did not deter me from trying ; and after three days search, at some distance from the village, I obtained about thirty fruits, each containing one seed and the germ of a plant. A few I preserved entire in spirits, the rest I planted in a box of earth at once, to prevent their perishing, as is the case with most large seeds, if not kept constantly excited. Those I sent to the Royal Botanic Gardens, Kew, grew well, and at the present time plants of Cedron would be more easily obtained at the Royal Botanic Gardens, Kew, than in its native country. Those I brought to the Botanic Garden, St. Ann's, are thriving well ; some of the trees are now seven feet in height."

Dr. Link was Professor of Botany in the University of Berlin, and Director of the Royal Botanic Garden of that city, and is well known by several valuable contributions to botanical science, of which the earliest is dated as early as 1795, and the most useful his '*Elementa Philosophiæ Botaniciæ*,' 1824. He graduated at Gottingen in 1789, and shortly afterwards was appointed Professor of Botany at Rostock ; he was in England in 1841, and attended the meetings of the British Association held that year in Glasgow, his striking and venerable appearance at which gathering will long be remembered.

Notice of the 'Annals and Magazine of Natural History,' No. 39, February, 1851.

This number contains but three papers that have any bearing on botany : they are intituled—

‘Notices of British Fungi;’ by [the Rev. M. J. Berkeley, M.A., F.L.S., and C. E. Broome, Esq.

‘Victoria regina;’ by J. De C. Sowerby.

‘Botanical Society of Edinburgh.’

The British Fungi described are *Hendersonia Stephensii*, found on the dead stems of *Pteris aquilina*, near Bristol, by Mr. H. O. Stephens; *Piggotia astroidea*, on green leaves of elm, Springfield, near Chelmsford, by Mr. H. Piggot; *Rhopalomyces pallidus*, on decayed Russian matting, at King’s Cliffe, Feb. 10, 1848; *R. candidus*, on a mixture of dung, earth and hops, with the foregoing; *Balacotricha grisea*, on dead cabbage-stalks, old mats made of *Typha*, &c., King’s Cliffe, 1839—41; *Helminthosporium Smithii*, on holly-bark and wood, at Wareham, by the Rev. W. Smith; *H. turbinatum*, on dead wood, Speke Hall, Lancashire, July, 1840; *Cladotrichum tirseptatum*, on a dead stump, at King’s Cliffe, July, 1848; *Cladosporium depressum*, at Dolgelly, by Mr. Ralfs; *C. brachormium*, on the leaves of *Fumaria officinalis*, at King’s Cliffe; *Verticillium apicale*, on decorticated oak-branches, at Wraxall, Somersetshire, Feb. 1845; *V. nanum*, on pears, with *Cladosporium dendriticum*, at Cranford Bridge, by Mr. J. F. Graham; *V. epimyces*, on decayed *Elaphomyces*, at Rudloe, Wilts, Oct. 13, 1843; and *V. distans*, on the stems of herbaceous plants, at Cranford Bridge, by Mr. J. F. Graham. Several additional habitats are given for species previously described. It is peculiarly delightful to observe naturalists labouring in a field where the reward is so small, as among these minute and often evanescent Fungi. In the more conspicuous or more fashionable orders the honour of conferring a distinctive appellation may be some recompense, but here the name and the object are generally doomed by immediate oblivion, and the author’s only reward must be the thoroughly unselfish one of endeavouring to lead others to admire, even in the most minute development, the wondrous variety in design and matchless skill in execution which pervades the works of Nature.

In the paper on *Victoria regina* Mr. Sowerby contends that that plant should be called *Victoria amazonica*. Query: have we not had rather too much of this plant?

Botanical Society of London.

Friday, February 7, 1851. Arthur Henfrey, Esq., V.P., F.L.S., in the chair.

The following donations were announced:—

British plants from Mr. Fenton J. A. Hort, Mr. B. D. Wardale, and Mr. J. Lynam.

‘Journal of the Royal Agricultural Society of England;’ presented by that Society. ‘Journal of the Pharmaceutical Society;’ presented by that Society. ‘Magazine of Botany;’ presented by the Editors.

Read the continuation of Mr. Daniel Stock’s paper ‘On the Botany of Bungay, Suffolk.’—*G. E. D.*

Botanical Society of Edinburgh.

December 12, 1850. Professor Fleming, President, in the chair.

The following papers were read:—

1. Dr. Balfour, ‘An Account of a Botanical Excursion to Ben Chonzie and other mountains near Crieff, in October, 1850.’ He remarked that the other mountains had been neglected by botanists, but were very productive. Among the plants gathered were *Saxifraga oppositifolia*, *stellaris* and *nivalis*, *Potentilla alpestris*, *Sibbaldia procumbens*, *Gnaphalium supinum*, *Polystichum Lonchitis*, *Woodsia ilvensis*, *Asplenium viride*, *Poa Balfourii*, *Silene acaulis*, *Thalictrum alpinum*, *Draba incana*, *Carex capillaris*, *Hieracium alpinum*, *Lastrea Filix-mas* var. *erosa*, and *L. dilatata* var. *montana*. At the upper part of Glen Turrit, Dr. Balfour remarked the occurrence of numerous mounds resembling moraines.

2. Mr. Charles Lawson, jun., ‘On the Growth of the Tussac Grass (*Dactylis cæspitosa*) in Orkney.’

3. Mr. James Backhouse, jun., ‘An Account of the rare Alpine Plants picked by him in the Clova, Glen Isla, and Braemar districts in August, 1850.’

The following are the plants noticed, with his remarks upon them:—

Hieracium cerinthoides, Fries. On the mica rocks in the gorge of the Eannach, near Loch Lee; also at the head of Glen Fiadh, and in the ravine of White Water. Found originally by the late Mr. G. Don.

Hieracium Oreades, Fries. Ravine of the White Water; Cairntoul. No British station previously known?

Hieracium species nova. Resembles *H. melanocephalum* of Fries, but has large, broadly-ovate, bluntish leaves, forked panicles, and enormously-large shaggy heads. Two specimens gathered in a vertical fissure (almost inaccessible) on the great crag of Lochnagar.

Hieracium cæsium, Fries. Canlochen Glen, White Water, &c.

Hieracium rupestre, Allioni, Koch and Fries. A new and interesting species, which seems to be unquestionably the above-mentioned plant. Cairntoul.

Hieracium atratum, Fries. Maintains the same distinct character on Loch Esk Craig, Clova, Lochnagar, Canlochen, Garachary and Ben-na-bourd.

Hieracium pallidum, Fries, var.? Near to *H. persicifolium*, Fries: a curious and interesting plant.

Hieracium alpinum, typical. On Lochnagar and Ben-na-bourd? Exactly the same as the plant from Glaramara, Cumberland. It is covered all over with long, shaggy, white silk, and has broad-based, short involucreal scales. Its ligules are strongly ciliated. Under cultivation this plant becomes still less like *H. melanocephalum*.

Hieracium ———? Allied to *H. alpinum*, but differs in several respects, and seems to keep its characters. Ben-na-bourd and ravine of the Garachary.

Hieracium nigrescens. On granite rocks almost exclusively.

Poa cæsia. Very abundant and fine in a ravine in Canlochen Glen.

Poa Balfourii? Along with the previous one. I have not the slightest hesitation in pronouncing my *P. Balfourii*? specifically distinct from *P. cæsia*, with which it grows, but retains a perfectly different character. The two species may be described as follows.—

P. cæsia. Plant four to six, sometimes eight, inches high, erect, rigid, bluish green or slightly tinged with purple in the florets. Branchlets of the panicle spreading rigidly at right angles when growing. Florets acute, free. Leaves broad and short; joints covered and confined to the lower part of the stem. Ligules very long. *P. cæsia* loses its character by pressing.

P. Balfourii? Plant six to nine inches high, erect, rather slender, purplish green, not at all cæsius. Spike often rather lax. Branchlets spreading, but not at all rigid. Florets ovate, slightly webbed. Uppermost joint one-third from base; occasionally all the joints concealed. Leaves narrower than in the former species. Ligules very long.

Both the species appear to form tufts in the same way. In examining the latter I never thought of its being *P. Balfourii*, from the root of that species being described as creeping, and the ligules similar to those of *P. montana*, whereas they are as dissimilar as those of *P. annua* and *P. nemoralis*. *P. cæsia* has not the remotest connexion

with *P. nemoralis*. My impression is that *P. montana* and *P. Parnellii* are both varieties of *P. nemoralis*.

Poa nemoralis, alpine form. Canlochen Glen.

Poa montana. Sparingly in Canlochen Glen and near Loch Esk, Clova.

Poa laxa (*vivipara*). Abundant in and below the ravine on Lochnagar, intermixed with *Poa minor* and *Aira alpina* (*vivipara*).

Poa alpina (*vivipara*)? Strange, diminished form. Ravine of the Garachary and on Cairntoul. The true and evident *P. alpina vivipara* grows there also, but looks very different. *P. laxa* is there likewise, I suspect.

Carex leporina. In two stations above the corrie of Loch-nan-ean (Lochnagar). In two new stations in the great ravine of the Garachary north of Cairntoul, and spread over a locality half a mile long! in the corrie of Lochan-nain, Cairntoul.

Cerastium latifolium. A very beautiful object by the margins of rivulets on Cairntoul, and in the ravine of the Garachary.

Stellaria cerastoides. Cairntoul, Ben-na-muic-dhui, and Ben-na-bour.

Arabis petræa. At the same places.

Crepis succisæfolia. Canlochen Glen.

Saxifraga rivularis. In the ravine on Lochnagar. In two stations above the corrie of Loch-nan-ean. In a corrie on the south side of Cairntoul. Abundant in the Corrie of Loch-an-nain, north side of Cairntoul. Also on the eastern cliffs of Ben-na-bour!

Mr. Backhouse failed in obtaining *Carex Grahmi* and *Saxifraga cæspitosa*. He found *Woodsia ilvensis* in great abundance.

4. Mr. Thomas Anderson, 'A short Account of the Flora of the district around Clonmel, including parts of the counties of Tipperary and Waterford.' On Galtymore, a mountain rising to the altitude of 3000 feet, and lying about seventeen miles west from Clonmel, which is composed of a coarse, conglomerated sandstone, resting on the limestone of the surrounding district, he found, on the banks of a rill near the summit, *Saxifraga hirta*, associated with *S. stellaris*. At Glendine, near Youghal, he gathered *Trichomanes speciosum*. Near Clonmel, *Bromus maximus* was discovered, the only previous station known for it being Jersey, where it was found by Mr. Babington.

The season having arrived for noting the flowering of plants in the Botanic Garden, Mr. M'Nab stated that the *Helleborus niger* was in full flower on the 2nd of December.

Dr. Balfour exhibited from Dr. Jameson, of Saharunpore, specimens

of *Daphne Cannabina*, and samples of the paper prepared from it ; and gave an account of the mode in which the paper is manufactured.

Thursday, February 13, 1841. Professor Balfour, President, in the chair.

The following papers were read :—

1. ‘ On the Composition of the Ash of *Armeria maritima*, from different localities, with Remarks on the Geographical Distribution of the species, and on the presence of Fluorine in plants in general ;’ by Dr. Voelcker, Professor of Chemistry, Cirencester. After alluding to the observations made by Dr. Dickie and others as to the presence of iodine in plants growing near the sea, and its absence in the same species when grown inland, the author proceeded to detail the experiments which he had made on *Armeria maritima*. The plants analyzed were procured from four localities, *viz.*, the sea-shore near Edinburgh ; an elevated trap-rock at some distance from the shore near Edinburgh ; light, sandy soil in Mr. Lawson’s nursery, Golden Acres ; and granitic rocks on the lofty mountains of Braemar, contributed by Professor Balfour. Dr. Voelcker was able to detect traces of iodine in the ash of the specimens grown in the first locality, but none in any of the others. He also found in certain cases that soda was replaced by potash. The results of the analyses of the plants from the first-mentioned localities, suggested the following observations :—First, the proportion of alkaline chlorides, as well as that of silica, is considerable. Secondly, the quantity of soda is more abundant in the ash of specimens grown near the sea-shore, whilst potash prevails in the ash of plants grown on the solid rock *near* the shore. Thirdly, soda is entirely re-placed by potash in the ash of the plant grown in the nursery. Fourthly, the quantity of phosphoric acid in specimens from the third locality is considerable, when compared with that in those from the first and second. Fifthly, the proportion of magnesia in the ashes of *Armeria* in its natural state, is larger than in the ash of specimens grown in the nursery. (The character of the specimens grown in the nursery was somewhat altered, the plants being much more vigorous, their leaves broader and of a brighter green, and not so rigid as in the wild plant). Dr. Voelcker suggests that the chloride of sodium found in the specimens from Braemar may arise from the spray of the sea, or particles of salt carried inland by the winds and other agencies. He corroborated Dr. G. Wilson’s statements as to the existence of fluorine in plants.

Dr. Balfour, in remarking upon the paper, stated that M. Chatin

had detected iodine in many aquatic plants in France, such as water-cress, marsh-marigold, water-lilies, reeds, various species of *Carex*, *Villarsia*, *Menyanthes*, *Myriophyllum*, *Ceratophyllum*, *Potamogeton*, aquatic *Ranunculi*, *Charæ*, *Conservæ*, *Callitriche*, *Fontinalis*, *Stratiotes*, *Scrophularia*, &c. He did not find iodine in *Ranunculus acris*, *bulbosus*, *repens*, nor *Cardamine pratensis*, although it was present in all the aquatic species of *Ranunculus* and *Cruciferæ* examined. His conclusions are,—First, that plants which grow in running waters, and in sheets of water sufficiently large to be strongly agitated by winds, contain more iodine than those growing in stagnant waters. Secondly, iodine is generally found, although in small quantity, in plants which are only partially covered with water, or only during a part of their life. Thirdly, plants which contain iodine when growing in water, lose it when they are developed out of water. Fourthly, the proportion of iodine observed in plants is independent of their place in the natural system, and in general has no relation to specific character; iodine would thus appear to be an accidental, inorganic ingredient. It is present only in cases where iodine or salts of iodine are contained in soil or water in which the plants grow.

2. ‘Remarks on numerous species of *Diatomaceæ* found in Peat from Cantyre;’ by Dr. Balfour. The author observed that the peat is remarkable on account of its containing an immense accumulation of leaves, which are comparatively unaltered in their structure. The bed in which it occurs is stated by the Duke of Argyll to be an extensive flat or plain, very little raised above the existing level of the sea, full of peat-mosses, strata of clay, with vegetable stems, &c. It must be of ancient date, as it is covered by clay and gravel, and there is reason to believe that a peat-moss now cut away lay over it. This moss, where it remains still uncut, is from ten to twelve feet in depth. The forms of the leaves are well marked, and the following appear to occur:—Leaves of *Salix Caprea*, *S. viminalis* or *stipularis*; stems and leaves of a moss; stems of grasses, and of a rush; leaves of a heath-like plant, either *Empetrum nigrum* or a species of *Erica*; and epidermis of birch. Mr. John Matthews, who had examined the microscopic structure of the leaves, &c., had detected woody and vascular tissue. He had also found scalariform vessels indicating the remains of ferns, and had detected the cellular arrangement of grasses, as well as of mosses. His investigations have shown the unaltered condition of the anatomical structure, and they call attention to the use of microscopic researches in determining the nature of

plants found under peculiar conditions, such as those referred to. On a farther examination of the peat, Mr. Matthews detected numerous species of Diatomaceæ, belonging to genera which were considered by Ehrenberg as referrible to the animal kingdom, and figured by him as such in his splendid work on Infusoria. Mr. Cobbold aided Mr. Matthews in these researches, and their combined labours have detected numerous species, belonging to the following genera:—*Navicula*, *Cocconema*, *Gallionella*, *Campylodiscus*, *Fragillaria*, *Diatoma*, *Euastrum*, *Gomphonema*, &c., along with some spiculæ of sponges. The leaves found in the peat having been examined by Dr. Voelcker, give the following result:—Ash from leaves dried at 212° — $32^{\circ}46'$. Ash of a reddish colour, apparently from the presence of oxide of iron; resembles ordinary peat-ashes in many respects. Dr. Balfour, in conclusion, alluded to the occurrence of Diatomaceæ in immense quantities at the bottom of the ocean, in northern and southern polar regions, as well as at the mouths of rivers; and gave some of the observations of Ehrenberg and others on the Infusoria occurring in Iceland, Spitzbergen, North and South America, Africa, and the Falkland Islands. He also remarked on the specific identity of the Diatomaceæ found in different regions.

3. 'Notice of a *Lepidodendron* found in Craigleith Quarry, and of a species of *Dadoxylon* discovered in the sandstone of Arthur's Seat;' by Mr. A. Bryson. Mr. B. exhibited a very fine section, measuring six by five inches, of *Lepidodendron obovatum* from Craigleith, which is apparently allied to *L. Harcourtii*, *Brongn.*, and in which the structure is distinctly shown. He also exhibited a section of *Dadoxylon* from sandstone under the trap of Salisbury Crag, showing disk-bearing woody tissue: this plant Mr. B. supposes to be allied to *Dadoxylon* (*Pinites*) *Withami*, which is found at Craigleith. Mr. Bryson stated his opinion that *Lepidodendron* would be found closely allied to the tree-ferns of the present day.

In allusion to the beautiful sections exhibited by Mr. Bryson, Dr. Balfour took the opportunity to call attention to the labours of Mr. Wm. Nicol, who had been the first to prepare such specimens, and whose great exertions had been too much neglected.

4. 'Notice of several new Indian plants;' by Dr. Cleghorn, H.E.I.C.S. Dr. C. stated that he was indebted to Dr. Wight for publishing some of his drawings of Mysore plants in that great work, the '*Icones Plantarum Indiæ Orientalis*,' now in progress; and which, while it will form a lasting monument to the industry and labours of

the author, supplies to the student of Indian botany a standard work of reference, illustrating the Indian flora, so far as it goes, as perfectly as Sowerby's 'English Botany' depicts the British flora.

Dr. Cleghorn exhibited the original specimens of *Osbeckia hispidissima*, *Wight*, and *Mitreola paniculata*, *Wall.*, figured in the part recently received from Madras; *Dunbaria latifolia*, *W.* and *A.*, dedicated to Professor Dunbar, of Edinburgh; *Alysicarpus styracifolius*, *D.C.*, *Hedysarum glumaceum*, *Rox.* Fl. Ind. iii. p. 646: the ticket of the original specimen in the Edinburgh University herbarium, in Roxburgh's handwriting, is distinctly written "*H. plumaceum*." The error has been copied into subsequent works.

5. 'Report on the state of Vegetation in the Edinburgh Botanic Garden, from the 13th of January to the 13th of February current;' by Mr. J. M'Nab. This communication embraced the following register of the periods of flowering of plants in the open air, as compared with the dates of the first flowering of the same species (in most cases the same individual plants) in the Botanic Garden last year.

Dates of Flowering.

	1851.					1850.
<i>Alnus glutinosa</i>	-	-	-	-	January 13	
<i>Eranthis hyemalis</i>	-	-	-	-	" 15	February 14
<i>Primula vulgaris</i>	-	-	-	-	" 16	" 14
<i>Corylus Avellana</i>	-	-	-	-	" 16	" 16
<i>Erica herbacea</i>	-	-	-	-	" 16	
<i>Galanthus nivalis</i>	-	-	-	-	" 17	" 11
<i>Lamium album</i>	-	-	-	-	" 18	
<i>Helleborus odorus</i>	-	-	-	-	" 20	" 14
<i>Geum pyrenaicum</i>	-	-	-	-	" 20	March 22
<i>Leucojum vernal</i>	-	-	-	-	" 20	February 18
<i>Vinca minor</i>	-	-	-	-	" 23	" 23
<i>Symphytum caucasicum</i>	-	-	-	-	" 23	March 14
<i>Doronicum caucasicum</i>	-	-	-	-	" 25	" 2
<i>Crocus susianus</i>	-	-	-	-	" 26	February 16
<i>Potentilla Fragariastrum</i>	-	-	-	-	" 26	" 25
<i>Vinca major</i>	-	-	-	-	" 26	March 11
<i>Tussilago alba</i>	-	-	-	-	" 26	" 12
<i>Lamium maculatum</i>	-	-	-	-	" 26	" 19
<i>Galanthus plicatus</i>	-	-	-	-	" 28	February 14
<i>Daphne Mezereon</i>	-	-	-	-	" 28	" 22
<i>Tussilago nivea</i>	-	-	-	-	" 28	March 2
<i>Knappia agrostidea</i>	-	-	-	-	" 28	February 22
<i>Cerastium Biebersteinii</i>	-	-	-	-	February 1	
<i>Arabis procurrens</i>	-	-	-	-	" 1	
<i>Rhododendron Nobleianum</i>	-	-	-	-	" 2	

Dates of Flowering.

	1351.	1850.
<i>Arabis ibericum</i> - - - - -	February 3	
<i>Crocus vernus</i> and varieties - - - - -	„ 3	February 26
<i>Mahonia aquifolium</i> - - - - -	„ 3	
<i>Kalmia glauca</i> - - - - -	„ 3	
<i>Cerasus Lauro-Cerasus</i> - - - - -	„ 3	
<i>Symplocarpus fœtidus</i> - - - - -	„ 4	„ 18
<i>Symphytum tauricum</i> - - - - -	„ 6	
<i>Pulmonaria mollis</i> - - - - -	„ 7	March 11
<i>Asarum Europæum</i> - - - - -	„ 10	„ 7
<i>Iberis sempervirens</i> - - - - -	„ 10	„ 9
<i>Helleborus lividus</i> - - - - -	„ 11	
<i>Aponogeton distachyon</i> (in open-air pond) - - - - -	„ 12	„ 14
<i>Sisyrinchium grandiflorum</i> (Warriston Lodge)	January 27	„ 12
<i>Tussilago hybrida</i> (Cannonmills Cottage) - - - - -	„ 25	
<i>Orobis cyaneus</i> (Cannonmills Cottage) - - - - -	February 5	

Alluding to the mildness of the season, Mr. M'Nab exhibited flowering branches of the gooseberry and pear from open walls, and stalks of rhubarb from an open border, measuring nine inches in length, exclusive of leaf, from the gardens of Warriston Lodge.

Dr. Balfour exhibited a specimen of *Polysiphonia subulifera* new to Scotland, gathered at Lamlash, Arran, in August, 1850, by Mrs. Balfour.

Dr. Balfour likewise exhibited, from the palm-house of the Royal Botanic Garden, a flowering specimen of *Livistona chinensis*, taken from a plant thirty-eight feet high, measuring from the floor to the extreme point of the centre leaf. The lower portion of this palm is five feet eight inches in circumference. Above this point, the stem is covered to the extent of ten feet by the bases of the fallen leaves, above which fifty-four large, palmated fronds are fully expanded, besides numerous others in various stages of development, and so arranged as to give the head, which is twenty feet in diameter, a somewhat globular shape. This palm has three flowering spadices, standing upright, the largest being three feet six inches long, and more branched than the specimen exhibited. It grows in a box five feet square, and five feet three inches deep, in soil composed of very rough, brown loam, leaf-mould, and sand.

Dr. Cleghorn exhibited microscopic preparations, by Mr. John Matthews, of the stellate hairs and glands of *Rottleria tinctoria*, the latter only containing the colouring matter of the dye used by the Mahommedans.

Dr. Balfour mentioned that he had received a letter from Dr. Johnston, of Berwick, in which he states that he is now convinced that the *Anacharis Alsinastrum* found in the Whiteadder is of foreign origin.

A letter was read from Mr. C. E. Parker, of Torquay, noticing various instances which had been observed of the effects of lightning on trees, and mentioning the occurrence of *Tilia Europæa* on a promontory in the sea near to Torquay, where he supposes it to be indigenous.

Mr. M'Laren exhibited specimens of *Erica hyemalis*, *Epacris miniata* and *nivalis*, *Cactus*, *Primula*, *Cydonia japonica*, &c., prepared by dipping in wax melted in a steam bath. He found that the colour of the *Camellia* was destroyed by the operation; but he succeeded with all the other plants he had tried.

Mr. Gorrie exhibited specimens of the woods of *Quercus pedunculata* and *sessiflora*, grown in the glen above Crichton. These, with other specimens, were presented to the museum at the Botanic Garden.

Mr. G. Lawson exhibited specimens of *Peziza coccinea* from Arniston Woods, where it is at present in great abundance.

Microscopical Society of London.

January 15, 1851. Dr. Arthur Farre, President, in the chair.

A paper 'On the Femoral Plates or Scales of *Zootoca vivipara*, a kind of Lizard,' by J. B. Spencer, Esq., was read.

After some introductory remarks, in which the description given by Professor Bell in his 'History of British Reptiles' was noticed, as stating that this lizard was one of those distinguished by being covered with scales or plates, some of which possess a very curious structure, and among which the femoral plates are particularly distinguished as having pores, the use of which is not known, the author went on to state that these femoral plates occur in a single row on the under surface of each lower leg, and are usually ten or twelve in number. He, however, found upon examination that they did not agree with Prof. Bell's description, not being perforated, but on the contrary, their surface was produced into a semi-transparent process or horn, of a light yellow colour, without any discoverable perforation; these last, where they occur, being due to the rubbing off of the horny process, which is detached by a very slight touch. He was, therefore, induced to believe that these scales possibly serve to give the

creature a greater mechanical power of adhesion in certain cases. A drawing illustrating the size and position of the plates was also exhibited.

Mr. Quekett then directed the attention of the Society to an observation of a somewhat similar nature to that of Mr. Spencer, which he had made about ten years since, in the structure of the skin of a viviparous blenny (*Zoarcus viviparus*). In the description of the skin of this fish, Mr. Yarrell states that "the surface of the body appears, under a lens, to be studded with circular depressions;" it was found, however, that these circular depressions, which are always of a white colour, were due to the presence of small, round scales, about one-twelfth of an inch in diameter, each having a minute black spot; these are situated deep in the cuticle, like those of the eel, and in some situations occurred at certain tolerably regular distances.

Mr. Quekett afterwards spoke of what appeared to him a new fact in vegetable physiology, *viz.*, the unrolling (in a spiral manner) of the membranous wall of an elongated cell. The specimen from which the hair or hairs were taken, was the fruit of *Cycas revoluta*, from China. Upon detaching some of these hairs, which are situated on two opposite parts of the fruit, and examining them with a power of 250 diameters, two varieties were distinctly visible, *viz.*, perfect hairs, having both extremities more or less pointed, and others, in which the extremity attaching them to the seed was abruptly broken off: when these last were carefully examined, the broken ends were in most cases found unrolled in a spiral direction, the spiral being in the form of a band, the breadth of which gradually increases from below upwards. In these hairs there was no trace whatever of a spiral fibre, the membrane forming the wall being quite transparent and free from structure. Now, in most of the works on botany no mention is made of the manner in which vegetable membrane is capable of being torn. Dr. Lindley, however, in the last edition of his 'Introduction,' states that it generally tears irregularly, but that in *Bromelia nudicaulis* the torn edges are curiously toothed; but no instance is given in which the fractured portion is always in a spiral form. It was on this account the subject was brought before the notice of the Society.

Mr. Quekett then brought forward a curious instance of malformation in the spicula, both of the body and of the gemmules, of *Spongilla fluviatilis*. The specimen in which the spicula occurred, was found by Mr. Spencer, in the neighbourhood of Blackheath, and the drawings were made by Mr. Leonard, from two objects, one belonging to the Society, the other in the author's possession, both of which were

prepared by Mr. Spencer, from the sponge in question. Some of the long spicula from the body, which were of the form termed by Mr. Bowerbank 'biarcuate,' were curiously altered, some having portions of the shaft dilated into round knobs at different distances, whereby a moniliform appearance was produced, others having portions of spicula projecting from their sides, whilst in some few instances a series of half spicula was developed from the central portion of the shaft, in the form of a whorl. Amongst the spicula of the gemmules some few were found in their normal, *viz.*, birotulate state; but in the majority of instances either one or both extremities were strangely malformed. Sketches of the principal varieties, made by means of the camera lucida, were sent round for inspection.—*J. W.*

Botanical Notes on Plants chiefly growing in Essex, with Observations on some of the Localities mentioned in Hooker and Arnott's 'British Flora.' By E. G. VARENNE, Esq.

Anemone apennina, L., is mentioned in the last edition of the 'British Flora' as growing near Berkhamstead, Essex, but no place with such a name is known in the county. This error, which exists in all the editions of the 'Flora,' was corrected in Mr. Watson's 'New Botanist's Guide,' and it will not be amiss if the next edition of the 'Flora' be free from it.

Ranunculus parviflorus, L., is frequent on gravelly banks about Tiptree Heath, and also in many other parts of this neighbourhood. It does not appear to be a corn-field plant with us, though such is the general locality allotted to it in the 'British Flora.'

Papaver hybridum, L. On the cliffs at Harwich and at Southend this plant grows on London clay? It appears to affect the maritime counties, as it is said in the 'Flora' to grow in sandy and chalky fields in Norfolk, Durham, Cornwall, Kent, and Essex.

Fumaria capreolata, L., which, if frequent elsewhere, as the botanical works inform us, does not appear to be a common plant in Essex. It occurs on the slopes at Harwich. Mr. Watson, in the 'Cybele Britannica,' speaking of *F. capreolata*, says that it probably inclines "to the west and north rather than to the south-east of England."

Lepidium Smithii, Hook., has several localities allotted to it in the 'British Flora,' while *Lepidium campestre*, Br., is not so honoured;

yet it may be fairly doubted whether the one is not as generally distributed as the other, and perhaps more so.

Diploaxis muralis, D.C., was growing in quantity among the rubbish at the side of a brick-field in Riven Hall last autumn. The situation appeared a very suitable one, for the plant attained a large size, and might perhaps have been hastily referred to *D. tenuifolia*, but it proves to be a mere annual, and in other respects agrees with the specific characters of *D. muralis*, as given by Smith and Babington. In what may be considered its natural size, *D. muralis* occurs about the docks at Ipswich, accompanied by *Mercurialis ambigua*, *L. fl.*

Viola canina, Sm. The white-flowered variety of this plant, which Sir J. E. Smith says is not frequent, grows on a bank at Riven Hall.

Dianthus Armeria, L., stated in the 'British Flora' to be not uncommon in England, will require to be sharply looked after, for it is variable in its places of growth, as is correctly stated in the 'Cybele Britannica.' In this neighbourhood are several localities in which the plant may in some seasons be found, as among wheat by the side of a field at Kelvedon, and the outskirts of Lady Wood, at Tey. On a hedge-bank by the road-side at Messing, *D. Armeria* grew for some years, but it has now disappeared.

Hypericum Androsæmum, L. Not very unfrequent under hedges to the south of Kelvedon, where the subsoil is strong. *Hypericum Androsæmum* is mentioned as an Essex plant by Gerarde, who says it grows at Rayleigh, but it is not noticed as a plant of this county by the authors of the 'British Flora,' though Norfolk, Herts, Kent, Surrey, Bucks, Devon, Hampshire, and Cornwall are recorded as producing it. *H. Androsæmum* appears to be very widely distributed in Great Britain, but to record half the counties in which it is known to be found, and to omit the remainder, seems more likely to mislead than to instruct the student.

Geranium pyrenaicum, L. On banks by road-sides about Kelvedon, but not in meadows and pastures, as mentioned in the 'British Flora.' "Road-sides and pastures," which are Mr. Babington's habitats, give a more correct idea of the place of growth of this plant, at least so far as my limited knowledge allows me to form an opinion.

Trigonella ornithopodioides, D.C. It may be interesting to record that this plant is still to be found in the habitat mentioned by Ray in the 'Synopsis,' edit. tertia, p. 331:—"Mr. Newton, in our company, found it on the sandy banks by the sea-side at Tollesbury, in Essex, plentifully."

Trifolium filiforme, L. "Dry pastures and road-sides," frequent, Hooker and Arnott. The same statement is made as regards *T. minor*. In this neighbourhood, however, it would cost a person some time to meet with a specimen of the former, while he might very easily find abundance of the latter.

Orobis tuberosus, L., with linear leaflets, occurs in woods about Totham. The authors of the 'Flora' appear to consider this variety as a rare one, by indicating several localities in which it may be found, while Smith and Babington do not think it worthy of so much notice.

Pyrus Aucuparia, Gærtn., abounds in Porl's Wood, Messing, Essex, and though well known as growing therein for the last forty or fifty years, yet there does not appear to be any record of its having ever been introduced by planting. It thrives best in the light, gravelly, and sandy parts of the wood, but being regularly cut down for underwood, its aspect is that of a mere shrub. Gardens in the neighbourhood are indebted to Porl's Wood for young plants of the mountain ash.

Epilobium roseum, Schreb., flourishes in a spot of damp alluvial ground, used for gardening purposes, at Kelvedon.

Ribes nigrum, L. Close by the water of an ancient moat at Layer Marney are three or four bushes of *Ribes nigrum*, which, if not really wild, must have sprung up from seeds adventitiously deposited there, as the banks which inclose the moat are very steep, and covered with shrubby underwood to the water's edge. In the locality near the Hoppet Bridge, at Braintree, recorded by Ray, *R. nigrum* will now be sought in vain. I have also been unsuccessful in endeavouring to discover this shrub on the banks of the Blackwater, near Pattiswick, where it is stated to grow by Mr. J. M. Gibson (*Phytol.* i. 835).

Petroselinum segetum, Koch. On hedge-banks at Salcot and at Munden, and between Maldon and Munden, not uncommon on London clay? but liable to escape notice from its beginning to flower just before harvest, at which period it is cut down with other weeds, when the hedges and sides of the fields are trimmed. In the 'Botanist's Guide' there are five other localities for *P. segetum* in Essex.

Dipsacus pilosus, L., though long recorded in the 'Botanist's Guide' as an Essex plant, and still to be found, *inter alia*s, abundantly about Coggeshall, is not referred to the county in the 'British Flora,' though Norfolk, Suffolk, Sussex, and Surrey are mentioned in con-

nexion with it. In the two latter counties perhaps *D. pilosus* is less common than in Essex.

Filago gallica, L. Reported in the 'British Flora' as growing at Castle Heveningham, Essex. The Castle Heveningham of the time of Ray is known by the more modern name of Castle Hedingham. In this place the 'Old Botanist's Guide' informs us that *Filago gallica* has been sought for in vain, and since the 'Guide' was published there does not appear to have been any record of the rediscovery of the plant in the locality.

Veronica Buxbaumii, Ten., has become plentiful in corn-fields and cultivated land about Kelvedon.

Orobanche minor, Sutt., is as abundant in clover-fields in Essex as in the counties thought worth mentioning under this head in the 'British Flora.'

Mentha pulegium, L., grows on Tiptree and Bergholt Heaths. This plant has the character of being the smallest of the British mints. However correctly this may be considered generally to be a diminutive weed, it is not always so. Certainly, when it has no more soil than what is merely sufficient to cover the surface of the gravelly common it grows upon, it is small enough in dry summers, but when placed under more favourable circumstances as to soil and moisture, as for instance on the sides of a shady ditch, *Mentha pulegium* will attain the height of two or three feet, and be proportionally bushy. In this condition, however, the flowers are not so abundantly formed as in the smaller and more common variety.

Marrubium vulgare, L. "Frequent in England," 'British Flora,' p. 321. A very different idea of the frequency of this plant in England will be found in the 'Cybele Britannica.' For myself, I can only say that I have never yet met with the horehound in a really wild state.

Centunculus minimus, L. Tiptree Heath: met with on spots where the turf has been pared.

Statice Bahusiensis, Fries. On the Essex bank of the Stour, at Manningtree.

Chenopodium hybridum, L., was in great profusion in a gravel-pit at Feering last autumn, where it was allowed to grow undisturbed, a rare circumstance for a weed in this part of Essex. When luxuriant, *Chenopodium hybridum* is the largest and most stately of our English representatives of the genus, being upwards of four feet high, and branching out in all directions.

Schoberia fruticosa, Mey. Banks of the Blackwater, between Maldon and Mersea Island. Sir W. J. Hooker and Dr. Arnott omit

our Essex coasts from their list of the localities of this plant, although it is recorded in the 'Old Botanist's Guide' as growing at Wallasea Island and the west end of the marsh bank at Harwich, and although Mr. Watson, in the 'Cybele Britannica,' has referred the *Sueda fruticosa* to Essex.

Polygonum Convolvulus, L., var. *alatum*. This variety, which is said by the authors of the 'British Flora' to be of rare occurrence, is not unfrequent about Kelvedon, in hedge-banks on newly-turned gravel.

Juniperus communis, L. "Woods and heaths, frequent," 'British Flora,' p. 407. This does not convey a correct idea of the habitats of *Juniperus communis*. Sir J. E. Smith writes more correctly, "On hills and heathy downs, especially where the soil is chalky." "Uncommon in the southern provinces of England, except on the chalk hills," *Cybele Brit.* vol. ii. p. 411.

Habenaria bifolia, Br. "Moist copses, meadows, and marshes, frequent," 'British Flora.'

Habenaria chlorantha, Bab. "Dry pastures and heaths, sometimes in moist places, frequent," 'British Flora.' Our plants do not answer to these localities; *H. bifolia* being found but very rarely on Tiptree Heath, and *H. chlorantha* flourishing in the woods, chiefly where the subsoil is chalky. Mr. Babington's localities for the above two plants are more correct: the *bifolia* is referred to heathy places and the *chlorantha* to moist woods and thickets in the 'Manual of British Botany.'

Ophrys apifera, Huds. A solitary specimen of this plant, with flowers perfectly white, was found in Felix-Hall Park, Kelvedon, last July.

Potamogeton zosteræfolius, Schum., grows in a ditch running into the Chelma, near Chelmsford.

Potamogeton crispus, L., var. *serratum*; *P. serratum*, Huds. In ditches at Copford, and at Salcot.

Potamogeton prælongus, Wulf. Plentiful in the Chelma, between Chelmsford and Baddow.

Carex axillaris, Gooden., may be met with in the vicinity of Kelvedon, on the banks of ditches, in several places, and also in the neighbourhood of Coggeshall, towards Great Tey.

Gastroidium lendigerum, Gaud. "Places where water has stagnated near the sea, rare. Little Broddon and Great Leighs, Essex," 'British Flora,' p. 531. Little Broddon should be Little Baddow in the

‘Flora.’ Though the counties in which this grass is stated to be found are maritime, yet it does not appear that it mostly grows near the sea. In confirmation of this view, it may be mentioned that *G. lendigerum* is met with in fields about Kelvedon and the neighbourhood, twelve miles inland as the crow flies; that Little Baddow is not near the sea, unless the Port of Maldon can be so considered, from which it is distant five miles; and that Great Leighs is in the centre of the county. I have also a specimen from the late Mr. Griffiths, gathered at Mill End, Rickmansworth, Herts, Nov. 1831.

Avena strigosa, L. “Corn-fields, common both in England and Scotland,” ‘British Flora,’ p. 552. Surely *Avena strigosa*, L., is not common in England. Sir J. E. Smith, in the ‘English Flora,’ says it is common in Scotland, Wales, Yorkshire, and Cornwall; and Mr. Watson, in the ‘New Botanist’s Guide,’ gives localities for *Avena strigosa* in the counties of Cornwall, Sussex, Anglesea, Denbigh, Notts, York, and Durham: but the Sussex locality is of uncertain character, and in Notts there is but one locality recorded.

Aspidium cristatum, Sw. “Caxton Bogs, Notts,” ‘British Flora,’ p. 569. Caxton Bogs should be Oxton Bogs.

E. G. VARENNE.

Kelvedon, February 12, 1851.

Notes on British Ferns.

By the Rev. W. S. HORE, M.A., F.L.S., &c.

Hymenophyllum Tunbridgense. The finest Devonshire specimens of this fern that I ever saw were gathered by me in January last, in the wood immediately under Vixen Tor, on the borders of Dartmoor: they were growing on a granite rock, with a small quantity of moss intermixed, and were not sheltered from the rays of light more than other plants in the wood. I have also found this species in woods of Bickleigh Vale, within five miles of Plymouth.

Hymenophyllum Wilsoni. I met with this species in the wood under Vixen Tor, on the same day that I found the other species. Both grew under similar conditions. I record this fact, as in the locality of Shaugh Bridge, given in the second edition of the ‘British Ferns,’ on my authority, a manifest difference obtains in the spots selected by these closely-allied species. The barren moor of Shaugh rises abruptly from the banks of the Cad in its rapid and precipitous course from Dartmoor: a few bushes appear along the margin of the

stream, growing as it were from amid the granite boulders, which appear to have been hurled from the higher parts of the moor. These rocks are necessarily distributed in a most irregular and uncertain manner: in some places they are heaped upon one another to a considerable extent; in others the green turf is not wholly destroyed. The drainage from the higher parts of the moor keeps the lower regions in a more than ordinary wet state, and it is in such spots, where rock and soil are intermingled, that these ferns grow. A large mass of granite, resting on one extremity upon several smaller pieces, overhangs, and thus forms a sort of cave: at the mouth, so to speak, *H. Wilsoni* usually grows in abundance, fully exposed to the light in a northerly direction: *H. Tunbridgensis* is also at hand, but not at first visible; you must, in fact, look for it within the darker precincts of the cave, where nearly invariably it will be found growing amongst the moss covering the smaller pieces of granite, though not in such abundance as the other species. This hint may perhaps be useful to fern-cultivators, who usually find *Hymenophylla* difficult plants to manage.

Lastrea Thelypteris. This fern grows in the greatest abundance in all the swampy, uncultivated ground on the banks of the river below Norwich.

Lastrea cristata. In September last I discovered a new locality for this rare species in Surlingham Broad, or rather the waste land adjacent to the sheet of water, about five miles from Norwich. I found it only on two spots, and not in any abundance: the fertile fronds were already the worse for wear, having suffered from coming in contact with the surrounding rank herbage, through the winds which had previously prevailed. No British fern that I know is so crisp as this, and so easily broken: hence, I presume, arises its early decay. My attention was directed to the first spot where I found it by the yellowish green appearance of the fronds, all of which were young and barren, save two miserable specimens. The locality was an exposed one, and the fen-man had recently gone over it with his scythe, which accounts for no old fronds being met with. In the other habitat the plant had been undisturbed by man or beast, and was growing amongst rushes, coarse grass, sedge, and reeds, some of which were far above my head. Here the fern was of a darker hue, and much more luxuriant. Very few specimens of *L. spinosa* were here to be found, though in the first locality a small form of that plant was the most abundant of the two. I should state that both spots were slightly raised above the level of the marsh, and were comparatively

dry. I must not be supposed to say that they were absolutely dry, for that would be impossible in such a district, influenced as it is daily by the tides, which are perceptible as high as Norwich.

Lastrea spinosa grows in the same Broad, but is of small size.

Lastrea uliginosa. When in London last week I saw a small plant of this questionable species at Kennedy's Bedford Conservatory, in Covent Garden: it certainly has an appearance intermediate between *crinata* and *spinosa*, yet I am inclined to agree with the Rev. W. T. Bree, that it is only a variety of the latter species. What struck me the most in the solitary frond that I saw, was the thin, rigid character which it presented, similar to that in barren fronds of *Lastrea recurva*, the small size of the sori, and the greater width of the pinnules, compared with those of *spinosa*. These conditions (the two last certainly) might, I think, be produced on plants of *L. spinosa* by keeping them in a very shaded spot, and supplying them liberally with water. My friend the fen-man, whose boat I engaged when searching for *L. cristata*, took me to a place where he said that for many years he had observed a large bunch of ferns: these ferns had grown at the root of an alder-tree which had been cut down, not rooted up, about two years ago: some half dozen sickly fronds remained, which, with their small sori and dilated pinnules, very much resembled, except in not being rigid, the frond of *uliginosa* that I saw in London. I have referred to the resemblance between the barren fronds of *L. recurva* and those of *uliginosa*, that is, as to texture. Now we know that *recurva* affects damp and shaded localities, and hence I think we may be justified in concluding that such conditions are not at least prejudicial or opposed to, if they are not indeed favourable to, the production of that state of rigidity which characterizes the supposed species now under consideration. I will readily admit that this last argument is somewhat forced, and does not satisfactorily prove that rigidity combined with thin texture of the parenchyme is dependant on an excess of shade or moisture, but it must be borne in mind that I only contend that such conditions are not antagonistic to such a state. Hence with my present amount of knowledge of facts and descriptions relative to this plant, I must subscribe myself an unbeliever in its specific identity.

Lastrea recurva. This, to me the most beautiful and lovely, as well as the most distinct, of our indigenous ferns, grows in great abundance around Clovelly, in Devonshire, extending nearly to Holsworthy, which is about ten miles inland. I know not whether this species is considered maritime, or whether its range extends indiffe-

rently over tracts distant from the sea. I have gathered it at Helston, in Cornwall, and in November last I found it clothing the hedges of a narrow lane near Hessenford, in the same county, with its crisped fronds, and attaining a greater size than I had previously witnessed. Hessenford is about ten miles from Devonport, and two from the sea: I did not see a single specimen to the east of the village, but on the other side, selecting the road to Looe, it is in great abundance. I had fancied that all British botanists were at length agreed as to this plant being a good and valid species, but such seems not to be the case. I have not seen the last edition of Hooker's 'British Flora,' but I glean from the pages of the 'Phytologist' that it is there recorded as a variety of *spinulosum*. Now whether this decision be pronounced by Sir W. Hooker or by Dr. Walker-Arnott, it is a formidable thing to find oneself placed in opposition to such high botanical authority. It is, however, probable that neither of these justly-celebrated botanists, men possessing a European fame, have seen this fern growing in its native habitats, or if they have it may have been when the question of its distinctness had not been fairly raised, and hence they did not observe it with that critical acumen which they usually display. Mr. Newman was, I believe, the first in this country to give a diagnosis of the species under consideration, by which it might at once be distinguished from *multiflora* and *spinosa*: I have seen hundreds of specimens, *all of which answer correctly to his description*, and I should say that no species of fern is less inclined to wander from the characters ascribed to it than does this from the characters given in the 'British Ferns.' But it is from an acquaintance with *L. recurva* in its natural localities that one feels satisfied that it is not a mere variety. It requires no close examination to separate it from the numberless fronds of *multiflora* in its neighbourhood: a single glance must reveal the truth. And if its progress from youth to old age be marked we shall obtain additional evidence: we shall find that barren fronds are not simply characteristic of youth, but are, I believe, invariably to be found on plants of all ages. We shall also find that the fertile fronds perish in the early months of winter, and that decay is visible in them even in November; and, moreover, that the barren fronds flourish uninjured, or mostly so, till the following spring or summer. Now I think these facts, placed in opposition to those known respecting the duration, &c., of *L. multiflora*, and *spinosa* are strong evidences of specific distinction, and will fully justify botanists in retaining this pretty fern amongst their list of

species, instead of reducing it to the humble grade of a variety of that coarse and gigantic monster, *Lastrea multiflora* !

Polystichum aculeatum. This fern I never saw growing wild in Devonshire or Cornwall till, in company with my friend the Rev. C. A. Johns, I met with it last month in the hedges between Totnes and Ashburton, in the former county : it extended for nearly two miles, and was mixed with the very common *P. angulare*, which grows luxuriantly in the western counties. *P. aculeatum*, however, did not appear at home in this new locality, as, although abundant, the fronds were comparatively small and unhealthy if contrasted with others from more favoured districts.

W. S. HORE.

St. Clement's, Oxford,
February 14, 1851.

Recollections of a Morning's Ramble in the Whittlesea Fens.

By the Rev. W. T. BREE, M.A.

IN the early part of July, 1840, happening to be on a visit of some days with a friend residing about two miles from Oundle, in Northamptonshire, I felt a strong desire to take that opportunity of making an excursion to Whittlesea Mere, a part of the country I had never seen, but knew by report to be full of botanical, as well as entomological, interest. Every day during my sojourn seemed to have its business or its pleasure ready cut out for it, except one ; and on that one we were engaged to dine with a much-revered friend residing some six miles or so in a nearly opposite direction to the fen country. Under these circumstances, what was to be done ? It was suggested that by rising somewhat earlier in the morning than usual, and taking advantage of a pair of post-chaises from Oundle, it might be possible to effect *both* objects,—to go to the Fens, and fulfil our engagement with our friend afterwards ; and as the proverb says “ Half a loaf is better than no bread,” it was unanimously judged that even such a hasty visit only as this arrangement would admit of, would be better than not going to the Fens at all. Accordingly the above scheme was resolved upon ; our friend drove us in his carriage to Oundle, and from thence we posted to Yaxley, a village situate close upon the fens, to the north-west of the Mere. Here our first care was to meet with some one used to the fens to act as a guide ; and we were presently introduced to a young man bearing a long pole, whose face, from having

been well tanned and sun-burnt, had assumed almost the colour of a mahogany table. Being ignorant of his real name, we distinguished him by the appellation of "Copperface." He proved a good guide, willing and obliging; was thoroughly acquainted with the "ins and outs" of that quarter at least of the Fens; and knew all the dykes and ditches, which of them, by help of his long pole, were passable, and which not. He had also a sufficient smattering of entomology (picked up, no doubt, from previous visitors like ourselves) to talk about a "swallow-tail,"—I think, indeed, he said "Machaon,"—and a "great copper," the latter of which insects he averred he had seen on the wing a short time before, in a spot to which he would presently introduce us. The day, however, proved nearly sunless, with wind; so that it was out of the question to expect to see many insects on the wing; and we were not so fortunate as to meet with a great copper. In the course of our ramble we surprised and killed a small viper, no unusual occurrence in the Fens; and I mention the circumstance only to correct a vulgar error on the subject: Copperface, who of course was well acquainted with the reptile, appeared to entertain very exaggerated notions as to its noxious qualities, and to fancy that even the bare touch of the animal's body after death might (to use his own words) "venom you." We met with but few birds in the Fens, except here and there a dabchick or waterhen in the dykes; and in one part we started a large flight of snipes; hence I conclude they breed there.

Whittlesea Mere is rather an awkward place to *go to see*; for, being surrounded (as I need hardly say) to a large extent by a tract of perfectly flat fenny country, and screened, moreover, by a phalanx of tall reeds* near the margin of the water, the nearer you approach the lake itself, the less able are you to get a view of it. Indeed, we might have rambled, I believe, the whole morning in the Fens without ever seeing the Mere at all, had not our considerate guide directed us to a spot where we could just get an imperfect peep at it. I much regret that time and circumstances did not allow of our taking boat, and embarking on this little fresh-water inland sea, so as to have enabled us to see more of it. A good distant view, however, of the Mere was obtained from the top of the hill as we descended into Yaxley.

* Reeds (*Arundo Phragmites*) form a considerable article of trade in these parts. They are cut at the proper season, and laid up in large stacks, like immense corn or hay-ricks, and used for the purpose of thatching, constructing screens, &c. The starlings, congregating in vast flocks, roost, I am told, among the standing reeds, settling upon them by thousands, so as to break them down, and do much injury. They are in consequence regarded by the fen-men as pernicious birds.

The object of the present communication is to record (so far as memory serves me) some of the rarer plants which we met with in the morning's excursion. And I do this the rather, because Whittlesea Mere itself, together with its surrounding Fens, is doomed at no very distant period to be converted into useful, homely, arable, and pasture-land; when of course its botanical and entomological treasures must be for the most part, if not entirely, annihilated. Many of the aquatic plants no doubt will continue to maintain their position, and flourish in the dykes;* for the dykes, I presume, must still remain, and be kept up for the sake of more effectual and permanent drainage. But alas! for the more rare and choice objects in each department of Natural History. Just the very things which naturalists would be most anxious to have preserved are quite sure to be destroyed! The water of the Mere was drained off last summer (1850); and in consequence Peterborough Market was (as I am informed) glutted to overflowing with the fish† that had been taken on the occasion. Cultivation had been gradually creeping on for many years past; and the plough had in various parts made no inconsiderable inroads on the Fens. If I am not misinformed, some parts near Yaxley where in 1840 we had

* These dykes, at least the broader ones, were, I suppose, once of a good depth in water, but are now much choked up with mud. We heard some mention made about a tradition of a human skeleton having been once discovered in one of the dykes, in an erect position; supposed to have been that of some unfortunate person who, having lost his way, accidentally got into the dyke, and was suffocated. The story, I believe, referred to a period long gone by.

We witnessed a boat-load of hay conveyed along a dyke, which presented a singular appearance. As the dyke itself was not apparent at a little distance, it seemed as though the load and boat were quietly traversing the *land*. We found on a nearer approach that the vessel was being punted through liquid mud, which it propelled forward. As the width of the boat or punt was nearly equal to that of the dyke in which it swam, the surface of the latter—whether to call it water or mud I scarcely know—was put in motion for a considerable distance ahead of the vessel; I should think for perhaps twenty yards or more the whole surface of the dyke was in agitation. Altogether here was a sample of rude navigation, of a character we had never before witnessed.

† The bare mention of *fish*, as connected with the Fens, calls to mind the dexterity evinced by a young fen-man in securing an eel which he had observed to enter a hole in the bank-side of one of the dykes. He first stuck his spade close to the mouth of the hole, in order to cut off the eel's retreat, and prevent its escaping again into the dyke. Then with another spade he dug down into the bank perpendicularly, till he came upon the eel, which he immediately caught, skinned, gutted, and completely prepared for the frying-pan, in less time almost than it takes to pen this brief statement of the exploit. We remarked to him that it was not the first time he had served an eel so.

gathered many bog and aquatic plants, have long since produced instead of them, crops of oats, barley, and the like. I could not help remarking the reluctance which some of the native plants seemed to evince at yielding up possession of their rightful territory where it had been partially drained and submitted to the plough. While the ground was in this *transition* state, as I may call it, they not only still struggled for existence, but even reappeared in unusual vigour. Thus, *e. g.*, in certain spots, the surface of which had been broken up, and even sown with an artificial crop, I observed the largest and most luxuriant specimens of *Samolus Valerandi* I had ever seen; and even the little delicate *Anagallis tenella* seemed on this occasion to have thrown aside much of its modest retiring habit, and exhibited, in broad dense masses, its most exquisitely tender pink blossoms, making quite a showy appearance, which caught the eye at a distance. I really should not have believed, had I not witnessed the fact, that this humble plant could have cut so conspicuous a figure. In fact, the aborigines were on the point of being forcibly dislodged, and they made a noble resistance. As regards insects, the case is perhaps somewhat different. The splendid *Lycæna dispar*, one while captured here abundantly, is now, I am told, scarcely, if at all, to be found in this locality. Its existence in Britain will probably ere long be mere matter of history,—one of the things which *were*, and *are* not. A collector and dealer at Yaxley informed me in the summer of 1848, that he had that season most diligently searched up and down all the dykes, and could scarcely find a single caterpillar; and he had, I think, only one specimen of the butterfly in his boxes. The Whit-lesea satin moth too (*Lælia cænosa*), I was told, *used* to be found in certain parts of the Fens, but had not been met with of late years. But I am straying from the subject, and must return to botany. Among the less common plants we met with on this occasion, I recollect the following:—

Veronica scutellata. Common.

Pinguicula vulgaris. Sparingly.

Utricularia vulgaris. The larger bladderwort almost choked up many of the ditches, which were quite gay with its bright yellow blossoms. I did not observe more than one species, though probably *U. minor* may also be found in this locality.

Schænus Mariscus. This plant, half rush, half sedge, constitutes one of the staple growths of the Fens, occupying as it does whole tracts of ground, and presenting a stern, bold aspect, as if it cared for nothing. Though a plant of no very attractive appearance to a gene-

ral observer, it excited in me a sort of admiration, its stiff, erect habit and harsh texture being in such perfect *keeping* with the wildness and inhospitableness of its native place of growth. I am not aware that the prickly bog-rush is applied to any particular economical uses, though possibly it might be so converted. The flower-heads and seeds, I was told, are a favourite food of pheasants, which are often attracted thereby into the Fens.

Lysimachia vulgaris. Frequent. Though naturally a moisture-loving plant, and growing sometimes in the wettest places, it thrives well in a common garden, and becomes troublesome. In cultivation it usually bears much larger heads of flower than in a wild state, but, like some other of our natives, loses much of its grace and elegance.

Hottonia palustris. Common in the ditches.

Samolus Valerandi. I have met with this plant in many different localities; *e. g.*, Warwickshire, Devonshire, Kent, the Isle of Wight, north of England, &c., but generally rather sparingly; nowhere in anything like the abundance, or such large and vigorous specimens, as in the Whittlesea Fens. I believe it is a plant of very wide geographical range, occurring in New Holland, and in all the four quarters of the globe.

Sium latifolium, *Phellandrium aquaticum*. These, together with some other aquatic Umbelliferæ, grow to a large size, and thrive prodigiously in the dykes, making a handsome appearance.

Parnassia palustris. Sparingly.

Drosera Anglica. Plentiful in one or two spots. This is the rarest of the British *Droseræ*.

Rumex aquaticus. Plentiful by the sides of the ditches, and very large and fine. This plant supplies food for the caterpillar of *Lycæna dispar*, as is well known to the collectors in the neighbourhood. When the leaves of the great water-dock begin to decay, they change to a bright colour, red, purple, or yellow, or a mixture of all, and are highly picturesque and ornamental. In grandeur of foliage it is only to be exceeded by the vegetation of the tropics.

Alisma ranunculoides. Common in the ditches.

Andromeda polifolia. I met with a specimeu or two in one spot only, but believe it occurs more copiously in other parts of the Fens.

Nymphæa alba. Plentiful.

Ranunculus Lingua. Plentiful by the sides of the ditches, and sometimes growing in the water, and rising to the height of three or four feet; a very handsome plant, and producing the largest blossoms of any of the British *Ranunculi*.

Galeopsis versicolor. Occurring sometimes in the marshy parts, but more especially where cultivation had commenced.

Lathyrus palustris. In Sowerby's 'English Botany' it is stated that this plant "thrives in a garden in good soil, even if not wet, and is very ornamental." Some roots which I brought away did not succeed with me, though planted in a pot of bog-soil, and kept moist. It is certainly a rare species, though not uncommon in the Fens: I had never met with it before, and was well pleased with the elegance of the plant and the beauty of its blue flowers.

What we considered as the *prize of the day* was the discovery of a little colony or two of the rare

Malaxis Loeselii. In one or two places growing among Sphagnum. On first setting about to get up a plant for a specimen, I dug round it as deep as I well could with my pocket-spud, in order to obtain the entire root; a labour which I soon found to be quite unnecessary, as a slight application of the thumb and finger to the stalk readily disengaged the whole plant, root and all. I do not think the fibres could have had any immediate connexion with the ground. May not the plant be considered as an epiphyte on the Sphagnum? In proof of the undisturbed quiet and entire security in which this interesting little orchidean here reposed on its carpet of Sphagnum, I may state that the flower-stalks of two, and sometimes of three, successive years were found still remaining on the same plant. First, there was the flower of the current year in full perfection; next, the dried stalk of the year previous, with its emptied seed-vessels; and lastly, in several instances the evident remains,—the skeleton,—of a still older flower-stalk.

Myrica Gale. If my memory does not fail me, I think I am correct in saying that this fragrant shrub occurred in several parts of the Fens. In spite of its odoriferous scent, perfuming the air as it does, to *my* senses at least, I have known this species go by the ordinary name of "*stinking willow*" among the common people in some parts of the country where it occurs abundantly. But concerning scents it seems men differ, as well as tastes, about which we are taught "not to dispute."

Lastrea Thelypteris. In great abundance, thinly scattered over acres of the Fens, but of unusually small size, the fronds on an average not being larger than those of *Cystopteris fragilis*. I could not find a single specimen in fructification. On a subsequent visit I met with it both in fructification and of the ordinary stature. This species, if I rightly remember, was almost the only fern, certainly the only

one to be at all considered rare, we observed in the Fens. There was no *Osmunda regalis*, *Lastrea spinosa*, or so-called *uliginosa*, all of which one might have reasonably looked to find, if not also the rare *Lastrea cristata*, which, had it occurred, need not have surprised us.

Such were the fruits of our morning's ramble. I deemed it not a very bad day's botanizing to have gathered some half dozen rare plants which previously I had not met with in a wild state; two of which, *Malaxis Loesellii* and *Lathyrus palustris*, I had never before seen; not to mention the *blossoms* of *Utricularia*, which till that time I only knew from figures and dried specimens; and these last afford but a very inadequate idea of the beauty of the living flower, which, like the different species of *Melampyrum*, seems almost invariably to turn black during the process of drying. I offer the above, let it be remembered, not by any means as a perfect list,—far from it,—but rather as a mere sample, of the rarities that are, or were once, to be met with in this interesting locality. As already said, our visit was a most hurried one, “*spatiis exclusus iniquis*.” And it was, too, but a very small portion comparatively, and that (for all I know) not, perhaps, the richest portion of this fenny district that we explored at all. I dare say we quite overlooked many interesting but less conspicuous species. In truth, we found attraction enough in things that were obvious and striking to occupy all our time and attention; and accordingly did not on this occasion suffer ourselves to get perplexed by the intricate race of *Carices*, or the not very inviting genus *Potamogeton*, of which, in each case probably, some of the less common species might have rewarded a more diligent and leisurely research.

Among the plants which I had beforehand confidently calculated to have met with on this occasion, *unus abest*—the water soldier (*Stratiotes aloides*). It *does* grow, however, in the neighbourhood, if not in some parts of the Fens, and in great abundance, as I am informed on unquestionable authority, though we were not so fortunate as to fall in with it. I was not without hopes also of finding the curious *Conferva ægagropila* (globe *Conferva* or moon-balls), had we been able to have seen more of Whittlesea Mere; for I fancied I had heard of its being found there. I conclude, however, that in this notion I must have been mistaken, since Copperface, to whom I endeavoured to describe the plant, did not appear ever to have seen or heard of such a thing.

After returning to Yaxley we parted with our guide, mutually well satisfied, I believe, and pleased with each other's company. No sort of offence or disrespect, let me observe, was intended to be conveyed

by surnaming him "Copperface." Perhaps we were remiss, and inattentive to our own interests, in not ascertaining his more legitimate appellation; for were I ever again to visit Yaxley Fens, I should be glad to renew our acquaintance, and avail myself of his services and his long pole.

As we quitted Yaxley the weather threatened a change; and presently rain came down in torrents. However, having a head to the carriage, we reached our friend's house dry and comfortable, and in time for dinner. I need hardly say we passed a most pleasant evening. Indeed, from beginning to end this was a holiday! And however devoid of interest the above account of it may be to the readers of the 'Phytologist,' the day itself has left some very pleasing impressions on the memory of the narrator.

I may take this opportunity to state, that in an excursion, a day or two before, to Monks' Wood, I gathered specimens, in plenty, of *Melampyrum cristatum*, a rare species, which I never happen to have seen elsewhere.

W. T. BREE.

Allesley Rectory, February 18, 1851.

Note on Lastrea uliginosa. By W. WILSON, Esq.

AFTER having compared Mr. Newman's specimens with numerous examples of *L. spinosa*, I was very much disposed to think that two different species had in time past been confounded by myself and others; nor was it until some connecting links were obtained by further search that I reluctantly abandoned a nascent opinion in opposition to that of the Rev. Mr. Bree. Even now I should be inclined to keep them separate, if the two forms could be proved to be permanently distinct in the mode of vegetation. I once thought that *L. spinosa* could be absolutely distinguished from *Aspidium dilatatum* of authors by its creeping rhizoma, a character which it certainly assumes when growing in damp, shady places in woods, but I have since learned to place no reliance whatever on this feature. On the borders of Risley Moss, about three miles from Warrington, these two ferns grow intermixed, sometimes in actual contact, and in precisely similar circumstances, on the margin of small drains or ditches, fully exposed to sun and air. In such situations the rhizoma appears to be equally tufted in both species, and I have for several years past given up that mode

of distinguishing them. At Wybunbury, I have certainly seen and gathered genuine examples of *L. spinosa*, which exhibit the same characters as the specimens from Risley Moss; but it may be proper to state that in a wood on the south margin of the bog at Wybunbury, when searching for *L. cristata*, two years ago, I repeatedly picked up and rejected fronds of what must have been *L. uliginosa*, imagining for the moment that I had at length found *L. cristata*.* I have two similar fronds from Oxton Bog, given by Mr. Valentine, but in these the pinnules are not adnate, nor so obtuse as in Mr. Newman's examples of *L. uliginosa*. I quite concur in opinion with the Rev. Mr. Bree, that *L. uliginosa* is not *L. Filix-mas*, nor *cristata*, and that it is still less like any form of *L. rigida*. As to the early barren fronds, I believe that I have observed them repeatedly on *L. spinosa* at Risley Moss, where in some cold and wet seasons the characteristic narrow fronds, by which it is so readily distinguished from its neighbour, have been almost wholly absent.

W. WILSON.

Warrington, February 22, 1851.

A Word on the Wild Snowdrop (Galanthus nivalis).

By WILLIAM BENNETT, Esq.

IN the barrenness of botanical interest which this season of the year affords, there is one treat peculiar to the present month, at least in its highest beauty and perfection, not surpassed by anything the whole gorgeous summer, in its rich and varied round, presents to us. It is some years since, in company with the esteemed editor, I first alighted on a bed of *Galanthus nivalis* near the village of Brockham, in Surrey, so profuse and extensive as to have puzzled us at a distance, with the appearance of a bank and patches of driven snow, which, at the temperature prevalent for some time previous, we knew it could not be. I have not failed to visit the spot at the proper season every year since, whenever I have had the opportunity; and notwithstanding occasional plunder, have rejoiced to see my favourites not only maintaining their ground amid the frost and storms of more bitter seasons, lifting their modest, graceful heads within each sheltered nook unin-

* I have since learned from the Rev. Mr. Pinder that the latter fern once grew in profusion in open ground, to the east of the wood, which is now under tillage. It is now become very scarce, but may still be found in the wood, and occasionally on the surface of the bog, among bushes.

jured, but gradually extending themselves by one or two advanced outposts of tufts or single plants along the adjoining lanes. This year the snowdrops were naturally somewhat forward; and a few days ago I had the pleasure of seeing them in undiminished numbers, and in unrivalled beauty and perfection. Passing into the village of Brockham by the bridge over the Mole, turn into the lane almost immediately on the right before reaching the principal part of the green, down over another small bridge past a school-house on the right, and one or two cottages on either side, until about some hundred yards further a brook crosses the road, which in falling weather would arrest the further progress of the thin-soled adventurer but for a plank bridge on the left; precisely opposite is a gate into a field on the right hand; enter; follow the course of the rivulet, which soon presents the irregular, deep, broken banks of a mimic torrent; and in a very few yards,—don't snatch the first prize, there are plenty beyond,—every fresh step displays the white, nodding masses of the graceful *Galanthus*, crowding the banks, hanging over the edges, filling the little bays, occupying all the sheltered nooks and coverts of the pretty windings of the streamlet, and extending so as to form the complete carpet of an old orchard on the other side. This last adjunct of course throws some doubt on the plant being truly indigenous here; but it is, at all events, most thoroughly naturalized; and this retired spot, with its quiet rural scenery, the richness of the surrounding landscape, even in winter-time, backed by the fine outlines of the Box-Hill range, is well worth a visit, and will amply repay the lover of Nature's simple charms. Nor is there among the gay daughters of Summer a flower more to be admired than is this humble, unpretending cottage-maiden, with her chaste, elegant, snow-white pendants, delicately tipped, and pencilled within with the purest, loveliest green,—the winning, cheerful, hardy herald of our early spring.

W. BENNETT.

London, February 12, 1851.

Wild Flowers in Bloom on St. Valentine's Day.

By E. T. BENNETT, Esq.

ALTHOUGH this is a period of the year which presents very little to attract the botanist who confines his attention to our native flowering

plants, yet owing to the extraordinary mildness of the present winter, a number I have thought worth recording have appeared in blossom during the first month of the present year, which I think may undoubtedly be considered as usually the dearest of all. As many as thirty-six species, belonging to nineteen natural orders, have been noticed in this neighbourhood. Nine species were last year's plants, which had lingered on since the autumn, and the rest were of this spring's growth. Among the most interesting may be mentioned *Nasturtium officinale*, *Scleranthus annuus*, *Glechoma hederacea*, *Stachys arvensis*, *Euphorbia peplus*, *Galanthus nivalis*, and *Ruscus aculeatus*.

E. T. BENNETT.

Dorking, February 14, 1851.

Note on Lastrea recurva. By RICHARD WHITE, Esq.

I CANNOT refrain from expressing my sympathy with the feelings expressed by *Lastrea recurva* (Phytol. iv. 48), and also my surprise at hearing that such high botanical authorities as Sir W. Hooker and Dr. Arnott should have expressed an opinion that that fern is not a perfectly distinct species from either *spinosa* or *multiflora*. I have given my assiduous attention to ferns, particularly British, for many years, both in observing them in their native localities and in cultivating them out of doors, as well as under glass. The first time I saw *L. recurva*, it was introduced to me as identical with those now named *spinosa* and *multiflora* (all being then called *dilatata*), but it then struck me as very remarkable that so great a difference in its appearance could arise from a mere modification induced by external causes, and this conviction induced me to test the question by growing several plants of these ferns side by side under the same circumstances, as I have tried many *real* varieties, particularly those of *Cystopteris*, which when taken from a dry and a damp locality seem to be distinct ferns; but if thus treated, in a few years all the apparent varieties become exactly alike, from being cultivated under the same influences. For upwards of five years I have had this experiment in force as regards *recurva* and its supposed allies, and I find that the distinctive characters increasingly develope themselves, and are more marked now than at first, and I will therefore proceed to state them in detail. Observing, firstly, that the native habitats are dissimilar, *recurva* in its Sussex habitats being found chiefly in the fissures of sand rocks,

and occasionally beneath them in the ground, but only when the soil is chiefly composed of sand and leaf-mould, so that water percolates through it immediately; whereas *spinosa* and *multiflora* are most frequently to be met with in damp soils, and sometimes even in swamps. Such opposite situations as these I am fully aware are quite sufficient to cause a very different development of the same species; but as before stated, when the whole group has been grown under precisely the same conditions through a series of years, and *recurva* still maintains its peculiarities, it quite sets aside that hypothesis. The chief distinctions are as follows; *viz.*:—The fronds never attain more than a third the size of those of *multiflora*, and are invariably less than those of *spinosa*; the colour is quite different, being a paler green, so much so that you may distinguish this species a hundred yards off; the edges of the frond are recurved, as the name implies, somewhat resembling parsley; the fronds endure through the winter and spring,—those on my plants are now fresh and green, while the fronds of *spinosa* and *multiflora* had entirely disappeared by last November. I would also further mention that I planted these three ferns in a very wet part of my garden, and found *multiflora* and *spinosa* flourish exceedingly, but *recurva*, after growing luxuriantly for some little time, rotted off, which circumstance tends to establish the fact that its very nature is essentially different from the others. I have only to say, in conclusion, that my experience and observations have so firmly convinced me of the distinctness of the fern in question, that I should have been less surprised to have heard it asserted that *Filix-mas* and *Filix-femina* were identical, with either of which it would associate quite as naturally as with *spinosa* or *multiflora*.

RICHARD WHITE.

Lyndhurst Road, Peckham,
March, 1851.

Botanical Society of London.

Friday, March 7, 1851. Arthur Henfrey, Esq., V.P., F.L.S., in the chair.

The following donations were announced:—

Parts 13 and 14 of the ‘Gardener’s Magazine of Botany;’ presented by the editors. Part 1 of Vol. xiv. of the ‘Journal of the Statistical Society of London;’ presented by the Society. ‘The Literary Gazette’ for January and February, 1851; presented by the

publishers. 'Journal and Transactions of the Pharmaceutical Society;' presented by the Society.

British plants from Mr. James Ward, Mr. W. Gourlie, jun., Mr. W. Wing, Mr. John Ball, Mr. F. Brent, and Mr. J. P. Norman. Foreign plants from Mr. J. Ball.

The continuation of Mr. Daniel Stock's paper 'On the Botany of Bnngay, Suffolk,' was read.—*G. E. D.*

Notice of the 'Botanical Gazette,' No. 27, March, 1851.

THIS number is rich in 'Original Communications,' having no less than three so classified: these are intitled—

'On the various forms of *Salicornia*. By J. Woods, Esq., F.L.S. Abstract of a paper read before the Linnean Society, January 21, 1851.'

'Is *Brassica Cheiranthus* found in Fifeshire? By Hewett C. Watson.'

'On the *Pyrus Aria* of England. By Charles C. Babington, M.A.'

The *first* of these will shortly come before the readers of the 'Phytologist' in an official form as part of the 'Proceedings of the Linnean Society.'

The *second* originates in Mr. Watson's possessing a specimen labelled in the handwriting of Dr. Dewar:—" *Sinapis tenuifolia*; near Dunfermline, Fifeshire. Collected and communicated by A. Dewar, 1848." Although the lower leaves are absent and the fruit immature, Mr. Watson cannot think it *S. tenuifolia*, nor can he quite confidently call it *Sinapis* (or rather *Brassica*) *Cheiranthus*; and he suggests that specimens may exist in other herbaria sufficient to decide the question.

The *third* suggests that the *Pyrus Aria* of England includes two distinct species.

1st. "*P. Aria*; leaves oval or oblong, unequally and doubly serrate or slightly lobed towards the end, nearly entire below; lateral nerves about twelve on each side, under side white and downy; flowers corymbose. Fruit scarlet." Of the distribution of this plant Mr. Babington is "unable to give any account."

2nd. "*P. Scandica*; leaves broad, lobed; lobes triangular, oval, toothed, deepest towards the middle of each side of the leaves; lateral nerves about seven on each side, under side white; flowers corymbose.

Fruit stated to be red. Basal quarter of the leaves finely serrate; apical quarter narrowly lobed." Gathered in Denbighshire, Devonshire, Somerset, Berkshire, Hampshire, and in Teesdale.

The subject is one of considerable interest, and I shall feel greatly obliged to botanists who will record their opinions as to the validity of the two species in future numbers of the 'Phytologist.' It has been suggested that *Pyrus Scandica* is a hybrid between *P. Aria* and *P. torminalis*, but I quite agree with Mr. Babington that this view is untenable. I do not like any way of evading a fair investigation into the merits of a question, and the doctrine of hybridity seems to partake of this character.

Under the head 'Literature' the following periodicals are noticed:— 'Transactions of the Tyneside Naturalists' Field Club,' 'Annals of Natural History,' Hooker's 'Journal of Botany,' 'The Phytologist,' Schlechtendal's 'Linnæa.' Report of Botanical Societies, London and Edinburgh.

Under the head 'Miscellanea' there is a list of thirty species found by Mr. John Ball in Strath Affarie, Inverness-shire. The interest of this list is not explained. The number concludes with an observation of Dr. Johnson's, which has already appeared in these pages, that he considers *Anacharis Alsinastrum* (*Udora Canadensis* of authors) as *introduced* into the Whitadder. This singular opinion requires to be backed by cogent reasons before it will be generally adopted.

*Notice of Hooker's 'Journal of Botany and Kew Garden Miscellany,'
No. 27, March, 1851.*

The number contains the following papers:—

'Das Königliche Herbarium zu Munchen geschildert. By Dr. C. F. Ph. von Martius.'

'An Account of the Dilpasand, a kind of Vegetable Marrow. By J. Ellerton Stocks, M.D., F.L.S.'

'Decades of Fungi. By the Rev. M. J. Berkeley, M.A., F.L.S. Decade xxxiv. Sikkim-Himalayan Fungi, collected by Dr. Hooker.'

'Extracts of Letters from Richard Spruce Esq., written during a Botanical Mission on the Amazon.'

'Contributions to the Botany of Western India. By N. A. Dalzell, Esq., M.A.'

A circular inviting subscriptions to cover in part the loss of Prof. Reichenbach's library and collections by fire. Reprinted in French.

A circular from the Association Botanique Française d'Exploration. Reprinted in French.

A circular from Dr. Nees von Esenbeck concerning his suspension from the Professorship in the University of Breslau.

A complaint from Mr. Woods of an erroneous report of his paper on *Salicornia*.

Notice of 'Museum Botanicum Lugduno Batavum sive Stirpium Exoticarum Novarum ex vivis aut siccis brevis Expositio, additis figuris. Scripsit C. L. Blume, Leyden, 1849.'

Concerning the dilpasand (*Citrullus fistulosus*), a plant allied to the gourds so commonly cultivated in this country, the following information is given, in addition to a detailed botanical description:—

"This species is known in Scinde by the name of 'mého:' in the Punjaub it is called 'hindwana,' the name of the water-melon in Scinde; and in the Deccan it is named 'dilpasand' or 'delicious,' a very appropriate name. I believe it is not known in Bengal proper, and it does not grow in the Concans or on the Malabar Coast, but is brought down, when there is a demand, from the more elevated, milder and drier climate of the Deccan. In Scinde it is cultivated from April to September, generally in the same plot of ground with common melons, luffa, gourds and cucumbers. The fruit is picked when about two-thirds grown, the size and shape of a common field turnip, two inches and a half high and three inches and a half across. It is pared, cut in quarters, the seeds extracted, well boiled in water, and finally boiled in a little milk, with salt, black pepper and nutmeg. Mussulmans generally cut it into dice and cook it together with meat in stews or curries. Hindoos fry it in clarified butter with split gram peas (*Cicer arietinum*) and a curry powder of black pepper, cinnamon, cloves, cardamoms, dried cocoa-nut, turmeric, salt, and last, but not least in their opinion, the never-failing assafœtida. It is sometimes made into a preserve in the usual manner. It is sometimes picked when small, cooked without scraping out the seeds, and regarded a greater delicacy than when more advanced. In England it might be cultivated and cooked like the vegetable marrow, which it much resembles in its qualities."

My friend Mr. Spruce does not enter so fervidly on the glories of tropical America as Mr. Bates in the pages of the 'Zoologist:' his communications are certainly to the point, and very business-like, but why they should be printed is not obvious. The following brief passages are selected as the most interesting:—

“ Santarem, January, 1850.

“ Thanks for the hints about Arums: Santarem is not the place for this tribe any more than for the ferns. The delta of the Amazon is more rich in ferns than any place I have since seen, and had I gone to Marajo instead of coming up here, I might have done better in both ferns and forest trees; but I was desirous to get into an Orchis country, if such existed. Now, however, I have traversed, from the mouth of the Amazon, a tract extending through from 700 to 800 miles, and I am compelled to conclude that it is the reverse of rich in Orchideæ. It is not their utter absence that I complain of, but their want of variety. Here up to Topajor are old low trees, filled with orchises, but all are of two species; in the neighbourhood of Santarem I have seen in all three species; I got a few up the Trombetas, but only two or three that looked at all promising. In other tribes of plants I confess to have been disappointed to see the flowers in general so small: in the tropics we look for everything on a gigantic scale, but here the flowers are rarely striking for their magnitude, although the plants that bear them are.”

“ I have seen no place yet with a vegetation so varied as that of Santarem, or where I can gather more species in a ramble. The campos, that seemed burned up in summer, are now assuming a new vegetation; and that not an annual one, but of plants whose roots have all the while been buried under the sand. In April and May they are said to be brilliant with flowers. I may hope, too, for a fair proportion of novelty, for the ground must be very imperfectly known. Martius is said to have been sick, from his half-drowning, whilst he remained here, and at Obidos he made no stay at all. From what I have seen, the south side of the Amazon has a much more varied vegetation than the north side: and I was disappointed at Obidos to find the mass of plants quite the same as at Pará.”

“ Santarem, April, 1850.

“ When I arrived at Santarem last October, I hired the only house that was vacant, for houses are more scarce here than elsewhere in the province; but it suits me very well, for it has a spacious verandah at the back, where we could work at our plants, and a paved yard, where we could spread our paper, &c., to dry. The adjoining house was tenanted by a single man, and we were very quiet; but when we returned from Obidos we found it tenanted by a family, from several days up the Topajor, including amongst them, besides children, several slaves, big and little, numbers of fowls, turkeys, guinea-fowls,

goats, dogs, land-tortoises, and other unclean beasts. I should mention that this house claims half our yard, and has a verandah continuous with ours : and then you will understand how, on our return, we found both yard and verandah befouled and worse than useless to us. A few live plants, that we left in the verandah, under the charge of a slave of Mr. Hislop's, he had the precaution to place in an outhouse which we have ; but there, for want of light and air, some of them had died. Since then our live plants have stood in the same outhouse, as near as possible to the window, kept wide open, and would do very well were it not that the niggers and the fowls continue to enter and play sundry pranks with them."

My extracts are not certainly very botanical, but they doubtless convey an accurate idea of the disappointments and disagreeables to which a collector in foreign lands is ever liable.

*Notice of the 'Annals and Magazine of Natural History,' No. 39,
March, 1851.*

This number contains but a single paper : this is intituled—

'Notices of the British Fungi. By the Rev. M. J. Berkeley, M.A., F.L.S., and C. E. Broome, Esq.'

The new species described are—*Dendryphium curtum*, found by Mr. Ogilvie on dead stems of nettles at Dundee ; *D. laxum*, on dead stems of *Inula viscosa* at King's Cliffe ; *D. griseum*, on dead nettle-stems at King's Cliffe, in March, 1850 ; *Rhinotrichum Bloxami*, by the Rev. Mr. Bloxam on dead wood at Twycross ; *R. Thwaitesii*, on the bare soil at Leigh woods, Bristol, August 2, 1848 ; *Fusisporium bacilligerum*, on leaves of *Alaternus* in the west of England ; *F. roseolum*, by Mr. Stephens on decayed potatoes at Bristol ; *F. fœni*, on the cut surface of a hay-stalk [perhaps hay-stack, *Ed. Phyt.*] at Ape-thope, Northamptonshire, in December, 1848 ; *Peziza Babingtonii*, found on rotten wood in Grace Dieu Wood, Leicestershire, by the Rev. Mr. Babington ; *P. viridaria*, on damp walls of a greenhouse at King's Cliffe, in November and December, 1845 ; *P. luteo-nitens*, on the bare ground at King's Cliffe ; *P. apala*, abundant on dead rushes at Spye Park, Batheaston, in February, 1850 ; *P. mutabilis*, on the leaves of *Aira cæspitosa* at Derry Hill, Wiltshire, in Feb., 1850 ; *P. Bloxami*, found by the Rev. Mr. Bloxam on fallen branches at Twycross ; *P. nitidula*, on the dead leaves of *Aira cæspitosa* at Batheaston,

in January, 1850; *P. stramineum*, on the dead sheaths of wheat and other Gramineæ at Fotheringhay, King's Cliffe, and at Rudloe, in Wiltshire, and on rushes at Oxtou, Nottinghamshire; *P. cornea*, on the dead stalks of *Carex paniculata*, at Spy Park, in March, 1850; *Tuber bituminatum*, in deep sand at Bowood, Wiltshire, in October, 1847; *T. scleroneuron*, at Bowood, Wiltshire, in October, 1847; *Onygena apus*, on decaying bones under dead leaves and moss at Bristol, in 1847; *Patellaria citrina*, on rose-twigs lying in a running stream, at Penllergare, near Swansea, by Mr. Moggeridge, in April, 1847; *Hypocrea farinosa*, on fallen branches at Milton, Northamptonshire, found by Mr. Henderson, and also at King's Cliffe; *Sphæria ochracea-pallida*, on elm-branches, Rockingham Forest; *S. muscivora*, on mosses upon the mud tops of walls in winter at King's Cliffe; *S. funicola*, on decayed rope at King's Cliffe, in October, 1841; *S. papaverea*, on rotten stumps at Batheaston, in March, 1850; and *S. appendiculosa*, on dead twigs of bramble.

I know not what I can say more than I have already done in commendation of the authors of this elaborate and highly scientific paper, but I may perhaps be allowed to express my admiration of the disinterested conduct of the proprietors of the journal, who devote so much space and incur so considerable a cost in making known to a very limited circle of students these obscure and all but universally neglected members of the vegetable kingdom.

Notice of the 'Naturalist, a Popular Monthly Magazine, illustrative of the Animal, Vegetable, and Mineral Kingdoms, with numerous Engravings. No. 1, March, 1851.'

It is with great pleasure I introduce to my readers this new candidate for the favour and support of scientific naturalists. Great praise is due to the projectors of a magazine got up in first-rate style as regards paper and typography, and illustrated with no less than seven engravings on wood, at the small charge of sixpence. This first number is devoted solely to zoology, with the exception of the literary notices of which I subjoin the titles; but the second number will doubtless make amends in this respect, and our favourite science will then obtain her fair allowance of space. It strikes me as possible that the editor purposes to devote a number to each science in succession, and judiciously commences with the most important, zoology. The notices are these:—

‘Twenty Lessons on British Mosses; or First Steps to a Knowledge of that beautiful Tribe of Plants, Illustrated by dried specimens. By William Gardiner, A.L.S. Third Edition. Edinburgh: Mathers.’

‘Twenty Lessons on British Mosses. Second Series. By the same Author. London: Longman and Co.’

‘The Royal Water-lily of South America, and the Water-lilies of our land—their History and Cultivation. By George Lawson, F.B.S. London: R. Groombridge and Sons. 1850. Pp. 108.’

Sketches of a Botanical Ramble in Wales.

By EDWIN LEES, Esq., F.L.S.

I HAVE observed that anglers, though by no means noted for their peculiar powers of scientific observation, generally take credit to themselves for noticing and enjoying the beauties of nature, doubtless taking their cue from honest Izaak Walton, who really had an eye for those little nooks of rural quietude which are unseen by such as have no time or inclination for following the mazy wanderings of the brook in its dreamy playfulness. So Mr. Scrope, in his ‘Days and Nights of Salmon Fishing,’ says:—“If a wilder mood comes over me, let me clamber among the steeps of the north, beneath the shaggy mountains where the river comes raging and foaming everlastingly, wedging its way through the secret glen, whilst the eagle, but dimly seen, cleaves the winds and the clouds, and the dun deer gaze from the mosses above. There, among gigantic rocks and the din of mountain torrents, let me do battle with the lusty salmon, till I drag him to day, rejoicing in his bulk.” Why, to such a scene among the wilds of the north we would gladly go, independently of doing battle with the lusty salmon, which we would leave Mr. Scrope to provide for us while we botanized, or transferred the exciting scene to the pages of our sketch-book.

But cannot the botanist in like manner enjoy pictorial beauty, sketch the changing landscape, follow up the wimpling stream among the hills, and imbibe a poetical sentiment from the scene, or even impart a moral, as well as the demure angler, seated beneath a pollard willow and poring over the stream, his mouth watering for a bite? I confess a disbelief in the philosophy of baiting a hook, and had rather walk on and find a plant than trust to the chance of a delusive

nibble! Well, I shall catch no fish, certainly, but will be satisfied with the beauties of vegetation, and the thoughts and incidents arising therefrom. Motion and excitement may produce as good a return for the trouble as any philosophy the statue-like angler can place in his basket.* On this head Dr. Drummond has well observed:—"I should hold it (angling) at a very low level compared with the occupations of the naturalist. That it has its undeniable pleasures, however, and that these arise in a great measure from the scenery in which the brothers of the angle exercise their art, there can be no question; and from that consideration I have referred to this favourite and absorbing pursuit. But while the study of nature leads us, like the pastime of the angler, from the crowded haunts of men into the quiet of the country, it has before it an unbounded sphere of thought and contemplation, and this advantage besides, that it is the source not merely of a temporary, but of the most permanent pleasure. When a botanist at any time examines the contents of his herbarium, there is scarcely a specimen there that does not recall to his memory the period, place, and other circumstances connected with the gathering of it; he lives over again, as it were, the time at which he discovered this plant or that, and when winter comes he is led by the vivid impressions of memory to recall the summer, enjoy its sunshine, breathe the mountain air, wander in the gloom of woods and glens, and in viewing his sea-plants, listen to old ocean's waves weltering on his rugged shores."†

The first botanical explorers must have had a fine field before them, and an unlimited range, not as now hedged in all directions, impeding the wanderer's movements, except on a beaten path. One cannot but

* I cannot help just giving here a specimen (from Hofland's 'British Angler's Manual') of the self-sufficiency of the angler, who really baits the hook of his conceit somewhat too often, while the poor botanist is generally thought little of because he has nothing for the pot, though in fact a "cat's-ear," a "colt's-foot," or a "fat hen," to say nothing of "lady's tresses," often comes within the reach of his retentive grasp. "The studious man, of whatever profession, although perfectly conscious of the necessity of air and exercise to the preservation of health, has seldom sufficient resolution to tear himself from his accustomed pursuits, without some powerful stimulus to action; and therefore any pleasurable recreation that may induce exercise, and lead the sedentary to the enjoyments of a pure air, breathing over woods, meadows, and waters, cannot fail to be beneficial. I am not acquainted with any amusement in which this advantage can be enjoyed without considerable alloy, except the diversion of angling!" Try a botanical excursion, Mr. Hofland!

† 'Observations on Natural Systems of Botany,' by James L. Drummond, M.D., a little work deserving of attentive perusal.

envy their initial look out over far-spreading heaths and wilds, though there might be some danger then from robbers, and more difficulty with impassable roads. But their noses smelt out the grand features and localities of plants, and in following their footsteps we perhaps, even in the present day, sport upon the best ground. It is a pleasure to me to get upon the track of the old botanists, become consecrated and classic by their indications, and probably it would be very instructive to examine in detail such primitive places at present.

Craig Breidden,* in Montgomeryshire, still maintains its position in all our floras as the peculiar locality for *Potentilla rupestris*, and hence I had often felt a wish to explore its declivities. Seen from the proud Wrekin, in Shropshire, it appears as a triple-peaked range of hills, similar in character but far less in extent than the Malverns. But from the vicinity of Welchpool these distinct hills, foreshortened, appear as one grand mass, like a purple castellated cloud of evening ascending in the horizon isolated and rugged, the black head of Moel-y-Golfa crowning the whole like a volcanic peak. It matters not the day or the year that saw me at Welchpool on my route to Aberystwith, but there I was; and goaded by botanical enterprize I determined to fulfil my pilgrim-vow of climbing Craig Breidden.

Fine but sultry weather had set in with the month of August, and though in general no stickler at dusty roads or rutty lanes, wishing to reserve myself for the heights of the Craig, I got mine host of the 'Bear' to furnish me with a gig, and having previously sent on a guide, took him up at the second turnpike, where, diverging from the main road, we proceeded along some rutty, marshy lanes till we arrived at the base of the mountain. Here a narrow pass presented itself between Craig Breidden itself and the frowning Moel-y-Golfa. Dismounting at the end of this pass, I sent the horse and gig to wait my return at a small road-side inn called the 'Plough and Harrow,' not far distant, and then dashed on with my guide for the summit of the Craig.

From the distant view I had obtained of Craig Breidden, and all accounts I had met with of it, I expected a rude, waste, precipitous mass of rock and glen, over which an explorer might wander without any obstruction, save that of the steep escarpment of the rock. I was therefore somewhat surprised at being ushered into a dense plantation of firs and larches, at whose skirts two white boards ominously exhibited a Priapeian aspect to scare intruders, one threatening pro-

* Generally pronounced Brithen.

secution for picking up sticks, and the other for lighting fires. Like poor Clare, the Northamptonshire bard, I felt disposed to vent an anathema upon enclosures, but it was useless; there the larches were of twenty years growth or more, and beneath their canopy I must proceed. Accordingly, on through the plantation we went, occasionally passing a protruding mass of rock, and my guide led me to a rough column of stones, erected, he said, in honour of Lord Rodney, renowned in the naval annals of the last century, and which he seemed to think was the *ultima Thule* of our journey. Nothing, however, was further from my thoughts. In the first place, without yielding in patriotism to any of my countrymen, nothing could I see in the wretched mass of stones before me to call up a single association; it is, in fact, a chimney-like mass of rough slabs, put together in the roughest manner possible, perhaps about forty feet high, without the slightest inscription, and might as well be supposed to commemorate Caractacus as Rodney. It has, however, the solitary merit of standing on the highest part of the hill, and may therefore have its use as a rallying point amidst the maze of foliage now cloaking the sides of the formerly exposed Craig. A magnificent view extends from this point in clear weather, but unfortunately it was now hazy in every direction, except towards the mighty mass of Cadir Idris, while Snowdon himself, frowning and scarcely visible, was involved in a huge tiara of clouds circling around his gloomy forehead. Dyer, the author of the 'Fleece,' who seems to have scaled the mountain when it was but a pasture for sheep, thus rapidly sketches the general view without stopping to particularize:—

“Huge Breaden’s stony summit once I climb’d
 After a kidling : Damon, what a scene !
 What various views unnumber’d spread beneath !
 Woods, towers, vales, caves, dells, cliffs, and torrent-floods ;
 And here and there, between the spiry rocks,
 The broad flat sea.”

All this, whatever poetry might imagine, an interminable haze prevented me from now distinguishing.

Perceiving few plants near the column, except *Erodium cicutarium* and *Sedum Forsterianum*, the latter of which is abundant on the rocks of the summit west and north, I prepared for a debouch into the thick of the plantation, to the surprise of my guide, who rather wondered at my retreat from the column. I now found the unpleasantness occasioned by the planting of the hill, for the firs and larches have

become so thick as to be penetrable with difficulty, and the heath has grown so tall and dense that every step immerses one up to the middle, while the crevices being entirely hidden from view, every now and then a prostration to mother earth becomes inevitable; and besides, the shade of the scene renders the progress precarious and uncertain. 'Tis true, an occasional break in the sombre forest is delightful; the stony ravine winding among the trees, flanked on both sides by tufts of flowering heath and ling, covered with humble-bees, booming as they dashed off from blossom to blossom, and the opening expanse of verdant meadows below, silvered with the windings of the infant Severn, and backed by cloudy, frowning mountains, has a charming effect; but the want of a practicable path is rather a set-off to this, for it is really difficult to keep erect where no bottom is perceptible. After stumbling for a considerable time to very little purpose amidst this overgrown accumulation, and occasionally digressing into a ravine, we got to the top of the hill again, and proceeded to its northern extremity. Here, while looking about for a convenient place of descent, we came to a very remarkable and precipitous fissure or chasm, extending from the top of the hill, at a very high angle, apparently to the very bottom. Into this fissure we lowered ourselves, and, unimpeded by plantations or bushes, effected an easy though in some places rather nervous passage, by a natural glacis or inclined plane, to the base of the mountain. In and about this fissure I observed more plants than elsewhere on the Craig, which is unfortunately at present so obscured by the larches.

Some of the more interesting plants were *Arabis hirsuta*, *Cardamine impatiens*, *Hypericum montanum*, *Potentilla argentea*, and *Circæa alpina*. Here, too, many *Hieracia* were clustered and in full flower, as *H. murorum*, *H. maculatum*, and the very curious and striking form of *H. Pilosella* that has been designated *Peleterianum*. The very attenuated lanceolate leaves of this form, densely fringed with long extending hairs, and tufted at their extremities, with its tall flowering-stalk, give it an aspect at first sight very peculiar. Many of the leaves are three inches in length, and the single-flowered stem more than six inches high, so that when compared with the stunted form that grows on the Malvern hills, scarcely rising above half an inch, which I have called *brevicaulis*, it would scarcely be imagined that they could possibly both belong to the same species. Indeed, there seems this difficulty both with the *Hieracii* and the *Rubi*, that the difference between varieties are quite as great as those existing between alleged species. The *H. maculatum* of Smith, which I

here noticed, is generally referred to *H. sylvaticum* or *H. vulgatum*, *Fries*, while if it must be joined to something else, I should agree with the late Mr. Bowman in placing it with *H. murorum*.

About the fissure down which we scrambled, I gathered some specimens of *Scabiosa Columbaria*, taller than any I ever before met with, and there were many of them finely in flower. "Scarcely a foot high," Hooker and Arnott observe in their 'British Flora,' and indeed in dry calcareous spots they are often only three or four inches in height; but on these trap-rocks they were flourishing more than two feet in altitude, and were fairly entitled to a *major's* commission. *Digitalis purpurea* was extremely plentiful all about the Breidden hills. Perched on the rocks bounding the precipitous descent I have mentioned, were many trees of the *Pyrus Aria*, with unripe fruit, but the crags on which they waved their silvery foliage were so abrupt, that I had considerable difficulty in mounting them to obtain specimens.

I need not now enumerate the more general plants of rocky places which I noticed here, such as *Cotyledon Umbilicus*, *Sedum Telephium*, &c., for on this first visit having become rather tired with my clambering efforts, and the day declining, I fell back upon the little hostel of the 'Plough and Harrow,' and in the silence of twilight scudded back to Welchpool.

On examining carefully the plants collected on my first expedition to the Craig, I found I was defective in two or three of its greatest rarities, and concluding therefore that I must have missed one of the most favourable points, I once again started on the morrow for another perambulation. This time I went alone. Taking the route up the ravine between the Craig itself and the steep slopes of Moel-y-Golfa, I was struck by the appearance of the southern precipices of the former, producing for some distance up the hill a crumbling talus of loose stones, surmounted by very steep and almost inaccessible crags. I resolved to examine this, and soon lighted upon *Geranium sanguineum*, growing pretty plentifully among the stones, though only a few specimens were now in flower. Persuaded I was now on the right scent, I cautiously peered upwards, and mounting the glacis, kept working my way among the disjointed stones as well as I could, though the broken fragments shelving downwards rendered it rather difficult to stand. Having surmounted the talus, I was rewarded by at once stumbling upon *Potentilla rupestris*, which I was particularly anxious to find, though now in seed, and in a great measure burnt up. There were several colonies of this local plant nestled among the

rocks above the crumbling glacis, more than sufficient, indeed, to render the fears of the late Sir J. E. Smith, as hinted in the 'English Flora,' as to the plant's being lost, quite futile. Still pressing by degrees higher among the steepest rocks, and in places with difficulty accessible, I found a few plants of *Lychnis Viscaria*. At length I paused before the abrupt escarpments that yet towered above me, and tacking to the right, took advantage of some trees growing on the acclivity to aid my course up the mountain.

It was at this point, about midway up Craig Breidden, that a sight of extreme beauty met my eye: the lovely *Veronica spicata*, var. *hybrida*, in its full perfection of flowering, covered for a great extent a shelving buttress of the hill, brightly blue, as if a wide patch of blue sky had been transferred from heaven to earth. *Origanum vulgare*, excessively plentiful, contrasted its regal purple with the loftier blue *Veronica*, while a few patches of *Helianthemum vulgare* gleamed with golden lustre among the rocks. I threw myself upon the turf, and resting from my up-hill work, for some time contemplated the scene with rapt enjoyment. Several of the tall plants of the *Veronica* had clustered heads, and both among the latter and the *Origanum* were pretty varieties with white flowers.

Leaving my mossy lair after a delicious reverie, I again addressed myself to complete the ascent, and at length, threading my way to the pillar where I had stood the day before, I glanced round at the wide-spread view. This day the Salopian plain was clear; Shrewsbury's spires and column beamed brightly amidst the green landscape, and the Wrekin towered behind, while eastward the shattered crags of the Stieperstones were plainly discernible. But southward and westward the prospect was splendid. Plinlimmon was singularly distinct, and the whole intervening heights to the majestic Cadir Idris vividly revealed, while the latter was robed in a veil so lucid as to exhibit every feature of the aspect of the mountain. For now the clouds would circle about its base, leaving clear its blue indented back; then again, rising up, they would dot its summit and ridges in the most fantastic manner, anon robing its awful head and leaving its sides clear, then rapidly passing from the summit again to roll about its sides and base, the sunbeams all the while illumining and decorating this moving phantasmagoria with a magical effect that could not be contemplated without pleasure. Sulky as ever, not one smile beamed from Snowdon, who, like a genius of horror, frowned dark and envious, while inky clouds hung over his lofty peak portentously, though without actually enveloping it from view.

I have often been struck with the numerous plants a single locality may produce within a comparatively small space, where rock, wood, water, bog, and sand combine their varied influences to give vegetation the elected habitats required. I was now again reminded of this by accidentally coming upon a marshy bog, surrounded by willows, in a hollow near the summit of the mountain I was now upon, where the *Menyanthes trifoliata* was located with a considerable number of *Carices*. I had not expected to see the *Menyanthes* in so elevated a position, but though so precipitous I believe the height of the Breidden is only about 1800 feet. According to geological data, Craig Breidden was most probably an islet when the "Straits of Malvern" divided Wales from England; and from what I saw of the vegetation here, I should think that something like half of the plants of the British flora might be found on and about this mountain. I noticed *Ribes Grossularia* among stones half way up the western side of the Craig, more "certainly wild," I should say, than as generally observed. *Mentha sylvestris* and *piperita* occurred by a rill in the glen between the Craig and Moel-y-Golfa, and elecampane (*Inula Helenium*) in great abundance in a meadow at the base of the latter height, where a lane turns round the southern side of the hill, about a quarter of a mile from the 'Plough and Harrow' public-house. The spot appeared to be quite a congenial habitat. At the south-west base of the mountain I observed several trees of *Quercus sessiliflora*. Roses and brambles, with many other plants of general occurrence, it would not be worth while to catalogue here; but I recommend the spot to the notice of the botanical rambler as well worthy attention, were it only for the beauty of the scenery.

After poring long amidst the hollows of the rocks, deep-embowered amidst the gloom of the firs that now envelop so much of the flanks of Craig Breidden, I not unwillingly emerged from the overpowering shades, that have changed the original character of the ground. The sun's declining orb had approached the tops of the distant mountains, surrounded by a cumbrous cloak of clouds, that already were hastening to enshroud the dark brow of Snowdon, and involve in misty dimness his abrupt precipices; while to the south Cadir Idris and the ridges towards Plinlimmon drank up the fervid radiance, and stood boldly forth in vivid outline.

With little time thus left for further survey, I hastened down the copsy valley intervening between the Craig and the central height, called Castell Middleton, and then, again advancing upwards, wound my way along the steepy ridges towards the volcanic-like peak of

Moel-y-Golfa, its black crags towering in my view. Another effort over a stone wall, and through a fir-grove with upstarting rocks, and the top was gained. The sun was just pausing on a height a little to the north of Snowdon. All the intervening landscape was brightly illuminated, and the infant Severn shone like the convolutions of a silver serpent amidst the green meadows below. Ridge appeared beyond ridge as an array of waves bounding indignantly towards a rocky shore, except that it seemed that ere they were solidified a puff of wind had opened a vast longitudinal furrow through their mass, and thus thrown them at that point into curious disorder. A mist hung over Plinlimmon, but the valley up to and beyond Welchpool, with its encompassing hills, had a most beautiful appearance in the chastened light. As I stood musing on the scene the sun went down, and gloom at once fell upon the whole country, the clouds contending with each other for the honour of veiling their peculiar hills with the greatest celerity; and lest the mists should seize me also, I at once dashed down over rocks and gorse-bushes, and threading the thick plantations, at last reached the 'Plough and Harrow,' whence I soon departed to rest my tired members within the walls of Welchpool.

EDWIN LEES.

Cedar Terrace, Henwick, Worcester,
February 27, 1851.

Note on Laminaria longicruris. By the Rev. GEORGE HARRIS.

I BELIEVE this plant has only been lately added to our marine flora. In course of last summer I came upon a specimen of it, stranded on the sea-beach, about a mile and a half to the west of the old church, an erection, by the way, more than eight hundred years of age. The specimen was about three yards long, abruptly terminated, as if broken off towards the upper extremity, and of almost equal thickness throughout. The stem was hollow, and in diameter measured seven-sixteenths of an inch. The root was quite entire, and exhibited no mark of having been drifted about. Adhering to the stem at regular intervals were nine or ten beautiful examples of *Lepas anatifera*. I am happy I can add that Professor Dickie, of Queen's College, Belfast, who has examined the plant, confirms the question of identity.

GEORGE HARRIS.

Manse of Gamrie, Banffshire,
February 25, 1851.

Notes of a Botanical Ramble in Ireland last Autumn.

By DANIEL OLIVER, JUN., Esq.

IF these few notes of a ramble in Ireland last summer should serve to induce other and abler botanists to take up their vasculums and go thither, a good object will have been attained.

In the month of August, in company with my friend G. S. Brady, I visited Colin Glen, which is within a pleasant walking distance from Belfast, our object being principally to see growing, and to collect, *Equisetum Mackaii*. We found the plant but sparingly, and not in catkin, near the upper end of the Glen. *Polystichum angulare* adorned the bank near the spot where we entered the wood in profusion; we had at home been accustomed only to *P. aculeatum*, so were here much pleased with the more graceful and delicate fronds of its ally. Beautiful plants of *Asplenium Trichomanes* and *Adiantum-nigrum* were observed. *Festuca arundinacea*, *Schreb.*, grew by the stream, but *F. sylvatica* I cannot say that we saw. Our stay at Enniskillen did not allow of a visit to Lough Erne; I have no doubt that many interesting lacustral and paludal plants may be found thereabouts. *Cotyledon Umbilicus* we observed between Enniskillen and Sligo, by the way-side, in some places in abundance.

Near the harbour at Sligo we collected a few coast plants, as *Salicornia herbacea*, *Arenaria marina*, *Aster Tripolium*, and others. On the 8th we took a car to Ben Bulbin, a mountain of much interest to the botanist, about eight miles northerly from Sligo. Leaving the conveyance by an Irish cabin near the base, we ascended a ravine in the side of the mountain, picking by the way *Meconopsis Cambrica*, *Hypericum Androsæmum*, *Saxifraga aizoides* and *hypnoides*, *Gnaphalium sylvaticum*, *Circæa alpina* or a form very near it, *Asplenium viride* and *Ruta-muraria*. Amongst steep crags, which prevented our proceeding further up the bed of the stream, we collected *Hieracium murorum*, var. ?, *H. pallidum*, *Fries* (according to C. C. Babington, to whom my kind correspondent F. J. A. Hort seems to have shown one of my examples). A few specimens of an almost inaccessible *Thalictrum* were obtained. To what species we must refer the latter I cannot at present say. My one remaining plant agrees pretty well with Jordan's account of *T. calcareum*, given in the 'Botanical Gazette,' No. 12, p. 312, by J. Ball, with whose Ben-Bulbin specimens it is probable that ours are identical. The carpels are not sufficiently matured to afford good characters.

Leaving the ravine behind us, we climbed towards some crags

which crowned the steep on the left, and amongst the plants collected about them was the little *Arenaria ciliata*, which was scattered about in considerable plenty, together with *Rhodiola rosea* and *Draba incana*. *Asplenium viride* grew beautifully in a curious perpendicular cleft or chasm in the mountain, which penetrated to some distance. *Silene acaulis*, generally out of flower, and *Oxyria reniformis* were also observed. Amongst rather long grass on the summit we stumbled upon an interesting form of *Melampyrum pratense*, which differs principally from the typical plant in being quite hispid; we afterwards found similar plants in Urrisbeg, by Roundstone, and also near the station of *Erica Mackaiana* on the Clifden road. The distribution of this form or variety must, I think, be different from that of the common plant. C. C. Babington, who has kindly examined the plant, considers it as an intermediate (I speak from memory) between *M. pratense* and his var. *latifolium*, which plant I have not seen. We experienced the combined horrors of mist, wind, and rain during the latter part of our stay on the mountain, which we left without noticing a single plant of *Dryas*, or of *Polystichum Lonchitis*. We were very anxious to obtain specimens of the former, which might agree with the figures and description in the 'Annals' of *D. depressa*; but under the circumstances further search would have been imprudent, and perhaps dangerous. Between Westport and Letterfrack we first observed the beautiful *Dabœcia polifolia* from our car; *Carduus pratensis* I also collected near the road before we left Mayo. *Scirpus setaceus* and *S. Savii*, β . *monostachys*, grew by the way-side near the Killery Bay, and perhaps the ordinary form of *Saxifraga umbrosa*, which, however, was not collected, being out of flower.

We were most hospitably received by a kind friend at Letterfrack, near the head of Ballynakill Bay, where we remained two or three days. In the neighbourhood grow *Nymphæa alba*, *Sedum Anglicum*, and *Osmunda regalis*. If I remember aright, *Lythrum Salicaria* was said to be one of the troublesome weeds of the place. Near Kylemore Lake we found sparingly the white and light-coloured varieties of the *Dabœcia*, *Arbutus Uva-ursi*, a *Hieracium*, named *cerinthoides* by my friend James Backhouse, jun., and other plants.

I brought home scarcely any *Ulices*, and paid little attention to living plants on the spot, so am unable to say whether or not the plant, *U. Gallii* of Planchon, grows in Ireland by our line of route. It is probable that the remarkably dwarf plants, abounding in rocky places, which at that time were in flower, may be referred to *U. nanus*, *Sm.* I do not recollect seeing an autumnal-flowering *Ulex* until

between Letterfrack and Clifden during the journey. We reached Roundstone by way of Clifden, and were comfortably lodged at McAuley's. The district thereabouts is full of interest to collectors. There is a notice of plants growing in this district in the 'Phytologist,' by Leslie Ogilby; also, I believe, in Loudon's 'Magazine of Natural History,' by C. C. Babington. In addition to the plants mentioned by these gentlemen as having been found near Roundstone, we collected *Hypericum Androsæmum*, *Asperula cynanchica*, *Eryngium maritimum*, *Raphanus maritimus*, *Sparganium natans*, *Cladium Mariscus*, *Viola lutea*, var. *Curtisii*, *Myriophyllum alterniflorum*, a very narrow-leaved variety of *Potamogeton natans*, *Asplenium Adiantum-nigrum* (a rigid variety), and others. I have already recorded *Spergula subulata*, *Naias flexilis*, and one or two of the above. It is very likely that the *Naias* may be found by careful search in other parts of Galway; the scraps which I obtained were in a small lake not very far from the village, I quite think floating, or perhaps detached, at the time of my collecting them; but unfortunately they were put away without either sufficient examination or consideration; it does so happen that we are at times unaccountably deficient even in ordinary observation.

A long search produced but a very few specimens in flower of *Arabis ciliata*, to the locality of which we had been favoured with directions. In Urrisbeg we did not succeed in finding a single example of *Erica Mediterranea* in the flowering state; its season was certainly far past, yet sometimes a few stragglers are found in the rear in such cases.

We re-found *Juniperus nana* on Urrisbeg; a plant, which is probably this species, was also collected near Kylemore Lake. We only found two flowering specimens of an *Allium*, which is very likely *Babingtonii* (the *Halleri* mentioned by L. Ogilby?), but never having seen authentic specimens, I cannot certainly say. *Lycopus Europæus* and *Anagallis tenella* grow about Roundstone; my note-book says they are "common enough." From Roundstone we visited Arran, in Galway Bay, and spent part of a day in examining the neighbourhood of Kilronan. It is useless my here furnishing a list of the plants which we observed on the island; most of the remarkable species have been already recorded. L. Ogilby has a few in the 'Phytologist,' and there is a notice by W. Andrews in the 'London Journal of Botany' of species noticed by him. Besides many of the plants of South Arran mentioned by these gentlemen and noticed by us, we collected *Aspidium angulare*, *Beta maritima*, *Geranium purpureum*, *Forst.*, an

Orobanche (parasitical on ivy, but having had very little practical experience in the genus, I have not determined the species; perhaps the specimens, collected in a late state, belong to *O. Hederæ*), *Pimpinella magna*, *Poterium Sanguisorba*, *Rubia peregrina*, *Saxifraga tri-dactylites*, the rayless *Senecio Jacobæa*, also the *Sagina stricta*, *Fries*, and *Polygonum Raii*, which I have already recorded, and which were kindly examined and confirmed by C. C. Babington. *Sagina maritima* is mentioned by Andrews, and is perhaps the same plant. The great Isle of Arran is a most interesting spot, and well worthy of a special visit. We returned home by way of Dublin, taking an opportunity of visiting the Portmarnock and Baldoyle district, where we found several species, as *Erigeron acris*, *Erythræa littoralis*?, *Geranium pyrenaicum*, *Reseda fruticulosa* or *alba* (apparently wild), *Statice rariflora*, *Ruppia* (perhaps *rostellata*), and several others. I may add, that if any of the Roundstone or Arran plants which are here recorded as new have been given in either of the lists before mentioned, it is an oversight for which I am to blame. By the way, any future botanist travelling in our district would do well to be provided with a good siphon barometer, or some other means of approximately ascertaining altitudes; it is very desirable that such observations should be made more generally in connexion with the occurrence of species.

DANIEL OLIVER, JUN.

Newcastle-upon-Tyne, March 18, 1851.

Potamogeton prælongus, &c., at Stafford.

By the Rev. R. C. DOUGLAS, M.A.

POTAMOGETON PRÆLONGUS, *Wulf.*, has not, I think, been announced as a plant of this county. It occurs at Stafford in the river Sow, a very sluggish and dirty stream, growing in great abundance, in company with *P. zosteræfolius*, *Schum.*, and a species of the *pectinatus* division, whose flowers are produced so sparingly that I have not been able to gather it in a fit state for accurately determining its name. Babington gives June as the flowering month for *prælongus* and *zosteræfolius*; Hooker and Arnott say July. It may therefore be worth mentioning that last summer I noticed them growing as stated above, in the same stream and under exactly the same circumstances, and found *prælongus* flowering in June, but *zosteræfolius* not before July.

R. C. DOUGLAS.

Stafford, March 25, 1851.

Note on Mr. Lees's Remarks on Starred Plants.

By the Rev. W. T. BREE, M.A.

————— “Boast of this I can,—
Though banish'd, yet a true-born Englishman.”

KING RICHARD II., Act. i. Sc. 3.

ON perusing Mr. Lees's “Remarks on some Starred Plants in the new edition of the ‘British Flora’” (Phytol. iv. 56), I was much surprised to learn that *Aquilegia vulgaris* is suspected to be an introduced, not a native, species. Now I have met with this plant, wild as I supposed, in many different localities, though at the present moment my memory does not serve me to name off-hand more than two, *viz.*, Shotover Hill, near Oxford, and my own wood on the outskirts of this parish. In neither of these instances, as well as in many more which might be added, can I bring myself to think it has been introduced, either by design or accident. The columbine, I firmly believe, has not crept out of the cottage-garden into the wood, but the reverse; it has been brought out of the wood into the garden. Mr. Lees appears to me precisely to have “hit the right nail on the head,” when he remarks so justly that “it seems to be lost sight of by many persons, how frequently the root of a pretty wild-flower is dug up from the place of its nativity and transplanted to a garden: this was done to a far greater extent formerly than it is now.” No doubt it was, before the introduction of such hosts of beautiful species from foreign countries, which have gone far to put our native beauties almost out of countenance. It has often struck me as quite a natural thing, and just what might have been expected, that the first rude attempt at floriculture should have consisted of the transfer to the garden of some of our more ornamental and less common, or at least local, native species. And accordingly plants more or less answering to this character we see (or *used* to see) find a place in almost every old woman's garden, though it were scarcely larger than the parlour carpet; as *e. g.*,—

Crocus vernus

Polemonium cæruleum

Vinca minor

Lonicera Caprifolium

Statice Armeria

Convallaria majalis

Hyacinthus racemosus
 Epilobium angustifolium
 Daphne Mezereum
 Saxifraga hypnoides
 Saxifraga umbrosa ?*
 Spiræa salicifolia
 Aquilegia vulgaris
 Trollius Europæus
 Fumaria solida
 Lathyrus latifolius, &c.

The foregoing list might readily be enlarged to a much greater extent; and I have often thought it might not be uninteresting to pursue the subject, and make out a more full and complete catalogue. Who that has any love at all for plants would see any one of the above for the first time in a wild state and not wish to dig up a root for his garden? In the olden time these species and the like appeared *worthy* of cultivation, and so were cultivated. And the consequence is, that they have in our eye lost, to a great degree, that character for rarity which they possessed as wild plants, from the circumstance of their being so very familiar to us in the garden.

W. T. BREE.

Allesley Rectory, March 24, 1851.

* I fix against this plant a mark of doubt, because after much investigation and inquiry, and in spite of all that has been written on the subject, I feel hardly prepared to admit its claim as an undoubted native. Amid the countless varieties of Robertsonian Saxifragæ which occur in such astonishing profusion on the Kerry mountains, I never could see one which coincided with the London pride of our gardens. I have seen it naturalized, as it were, in shrubberies and plantations near gentlemen's seats in Ireland, but never could meet with it on the mountains. With respect to the recorded Yorkshire habitat for Saxifraga umbrosa, Hessleton Gill, I visited that spot a good many years ago, chiefly for the express purpose of gratifying my eyes with the sight of Saxifraga umbrosa growing wild; and I brought plants of it away with me, which I have cultivated ever since. The locality itself, I admit, is wild to one's heart's content, and far enough away from house or garden. But after all there are reasons (which it might be tedious to state) which induce me, however reluctantly, to suspect that Saxifraga umbrosa may not be a genuine native, even in the above apparently truly-wild locality.

Records of Observations on Plants appearing upon newly-broken Ground, raised Embankments, deposits of Soil, &c. By EDWIN LEES, Esq., F.L.S.

To the thoughtful looking-out botanist, less concerned as to the "right," as the authors of the 'British Flora' put it, of a plant to be considered truly indigenous where it fortuitously presents itself, than desirous faithfully to record the freaks of vegetable growth, the sudden appearance of plants before unnoticed in the vicinity where they appear, or the crowds of others that may be well known, rankly uprising upon fresh-raised mounds or newly-collected soil, offers an interesting phenomenon, however common it may be. In some places, perhaps, garden mould has been conveyed to the spot, and garden seeds vegetate; but in other instances it seems clear that seeds, having lain long dormant in the ground, take advantage of the new circumstances that expose them to vivifying influences, and so rush into life to enjoy an ephemeral existence. Sometimes, however, it would appear as if the seeds that produce plants on such void spots had been wafted from a considerable distance,—

"The flowers of waste,
Planted here in Nature's haste."

I shall adduce facts in illustration of all these cases, those more especially that have reference to the appearance of numerous plants at one point, suggestive of seeds long buried in the soil, too deep for vegetation. It appears to me a matter of little consequence whether the fresh comers remain on their new ground permanently, though in the nature of things they generally cannot, the condition being mostly imposed upon them to keep moving on.

I noticed last year the occurrence of the *Atriplex hortensis* on the neglected embankment of the Worcester and Oxford Railway, and Mr. Reece's query on the cover of the 'Phytologist' has reminded me that I omitted to state the fact fully. It was not a scattered plant or two that was visible upon the soil, but dense thickets, ranged in rank array, that seeded luxuriantly. On visiting the locality again after my former account was sent to the 'Phytologist,' I came upon a long excavation in the embankment, that had been made for some purpose, and this was crammed from end to end with tall vigorous plants of the *Atriplex*, as thick together as one often finds *Onopordum Acanthium*. On another part of the line a quantity of *Beta vulgaris* or *maritima* was growing.

Now I think facts of this kind are very useful, as giving a date for the introduction of a plant into a particular county or place, and should be carefully attended to. It has been remarked with respect to *Delphinium Consolida*, now so common in the corn-fields of Cambridgeshire, that Ray does not mention it. Probably, then, the *Delphinium* has been introduced there since Ray's time, though it would not follow that it had not been there previously. A curious fact illustrative of this has happened in Worcestershire. When Bromsgrove Lickey was enclosed, now more than half a century ago, a gentleman of the name of Carpenter, who then lived at Chadwick Manor, and cultivated a good deal of the new enclosures, published a work on the agriculture of the district. In this he holds up the *Delphinium*, under the name of "Stavesacre," to universal reprobation, as one of the worst weeds he had to encounter in the new arable fields at Chadwick; he gives instructions for its destruction, and to make certain of his enemy, lest his description should fail, he actually gibbets it in a frontispiece to his volume. How long the *Delphinium* held up its head against this war to the hoe I am unable to say, but Mr. Carpenter rendered Bromsgrove Lickey no safe place for it to abide in, and as of course it could not like less specious plants to take shelter in the heathy spots still remaining, it is lost there in the present day.

The most remarkable appearance of strange plants that has fallen under my notice was mentioned to me by the Rev. Mr. Crump, of Shipston-upon-Stour, Worcestershire. Shipston is situated upon the lias, a geological formation generally considered to have been deposited in a shallow sea, and abounding with shells. Mr. Crump stated to me that a well having been sunk in this, to a depth of about twenty-four feet, the next year a quantity of the *Glaucium luteum* appeared upon the rubbish thrown out from the shaft. He was not aware that any plant of the *Glaucium* grew anywhere in the neighbourhood, nor is it at all likely. This would have been an additional vegetable link to Professor Buckman's 'Ancient Straits of Malvern,' for unless the seeds of the *Glaucium* were already deposited in the soil, it seems impossible to conceive that it could have got there from the *present* sea-shore. Of course the sea-poppy did not continue to flourish in such an inland position.

A case analogous to this met the observant eye of my amiable friend the Rev. J. H. Thompson, of St. Nicholas, Worcester, only last year. In a lane in the parish of St. Peter's, about a mile from Droitwich, where a mass of waste salt stuff, mixed up with other rubbishy matters, had been deposited, he noticed an enormous quan-

tity of *Lepidium ruderales* growing, to the amount of several hundred plants. About the same spot *Spergularia marina* was located in a similar position. As an instance of enthusiastic zeal confirming observation, I may mention that Mr. Thomas Westcombe, an unwearied botanist, who never takes anything for granted that he can prove for himself, on hearing of this occurrence of the *Lepidium*, not always to be found when wanted in our neighbourhood, set off on foot for the spot one afternoon in the autumn, but was so late ere he could reach the place that nothing could be *seen*; but feeling about him with his usual acuteness, he actually gathered the plant in the dark. Whether the littoral plants thus noted here *elected* themselves such a position from their love of saline matters, as hinted in Buckman's 'Straits of Malvern,' or whether their seeds had been conveyed with the rubbish, I must confess I feel rather dubious about. *Lepidium ruderales* is probably always present somewhere in the Droitwich district, but it never stays long in a place.

Some dissatisfied persons may possibly object to these migrations of plants, and think their doings unworthy of record unless they stay where they appear. Well, they do sometimes, though it is not generally to be expected; and I have one case at least, though I expect careless compilers, not anxious about anything that does not come close under their own eye, will take no notice of it. Eight years ago I recorded the appearance of *Lepidium Draba* on the then recently-made embankment of the road in connexion with the new iron bridge at Powick. It had never previously been observed in Worcestershire. There, however, the *Lepidium* has continued in tolerable plenty year after year, and there it *remains* at the present time.

Cardamine impatiens is generally accounted a rare plant in floras, and does seem to be very local. It is present, however, in many of the woods on the banks of the Severn, and where any new quarry is opened in the sandstone it starts up among the rubbish with singular rapidity. Soon after the new works of the Severn navigation were made at Lincomb, near Stourport, four years ago, the banks of the river became covered with it all about there, and quite a shrubby coppice of the plant existed in 1849. From the quantity of seed the *C. impatiens* produces it might indeed be expected to be very plentiful in its habitats, but this is not the case, unless where the soil has been newly turned up.

The statement of an experimental agriculturist, a worthy friend of mine, well exemplifies the storing up of seeds in the ground for future economical supply, and the exuberance with which they vegetate

when the occasion offers. This gentleman informed me that a few years ago he had a thistly pasture in the neighbourhood of Kidderminster, where patches of the *Carduus nutans* grew, an inheritance derived from a former possessor of the soil. As they appeared to maintain their position rather obstinately, he determined to get rid of the thistles by ploughing up the ground, and trenching it to the depth of two feet. This was accomplished, and a rustic of the vicinity, who was witnessing the operation, and knew the field, shrewdly remarked to my friend, "Yow'll get rid of them there thistles that grow'd every year, at any rate." My friend said that he thought that he really should. But the next year, to his surprise, the thistles covered the whole field in such prodigious numbers, that, to use his own expression, there was hardly room even to introduce a hand between their serried ranks. But they were now attacked vigorously with the hoe before seeding, cut up from end to end without mercy, and they reappeared no more. No doubt can exist in this case that the seeds of the thistle had accumulated for years beneath the soil, till, taking advantage of the broken-up ground, they had swarmed in this astonishing way.

The garden weeds of some places will really be plants indigenous to the spot indicative of former growth there, an instance of which presented itself to my notice last summer at Welcombe, near Stratford-upon-Avon, where, in a garden recently formed on the site of a demolished mansion there, I was surprised at the rank growth of numerous plants of henbane (*Hyoscyamus niger*), taller and more branched than I ever saw before; and unmarked by the gardener, these plants, loaded with ripe capsules, were scattering their seeds all around, the spreading branches arching towards the earth. In a spot close to classic Stratford one may be excused in quoting Shakspeare, who, with an eye ever open to analogical pictures, had evidently observed some such rank overgrowth as I have been alluding to.

"The seeded pride

That hath to this maturity blown up
In rank Achilles, must or now be cropp'd,
Or *shedding*, breed a nursery of *like evil*,
To over-bulk us all."

I have not often seen the "poisonous henbane springing up among sweet flowers," though Mrs. Barbauld in one of her hymns poetically alludes to such a circumstance, as symbolical of ill-tempered fellows maliciously spoiling the sweets of life; but it is remarkable that in another garden close to Stratford I observed the henbane as a weed,

and this was where a new house had not been long erected, and the garden was also fresh formed.

Oftener, doubtless, on broken-up land newly-deposited plants will appear than old inhabitants be resuscitated. Fly-away seeds, looking out like vultures for their prey, instinctively settle down upon any bit of waste or fresh turned-up soil to revel in, and so last year I observed the great *Cnicus eriophorus* very incongruously filling up the intervals in a gentleman's shrubbery at Powick, that had only recently been put into fresh order; and this in the very front of the mansion, an aggression not likely to be long permitted.

These facts of vegetable migration, though common enough to the experience of those who look out for them, ought not to be slurred over as undeserving of notice. They point out a law of nature ever in action, tending constantly to vary the vegetable robe of the earth, and give a rotation or right of enjoyment to different species on the same ground. It is really a curious thing to see what the operation of a spade will effect, and what desecration to the beautiful ensues. I was much struck with this in rambling some time since through Wyre Forest. I suddenly came from embowering oaks and mossy glades, bright with the wood geranium, *Habenaria*, *Epipactis*, &c., upon a little patch in the very heart of the green wood, which some charcoal-burner had appropriated for a season for potatoes, and then left in its abandonment. Mulleins, thistles, docks, *Atriplices*, snake-weeds, nettles, and all their abominable kindred had here viciously met together, as if by mutual compact, to give ugliness its full scope, and intimating but too well the track of mortal footsteps. Yet the forest loomed in its shadowy immensity on all sides, nothing but beauty and suggestive tranquillity within its mossy recesses; no similar plants existed but at a long distance from the spot, and it seemed strange how these monstrous weeds could have got notice of the vacuity in their murky haunts, and progressed hither over fair untainted scenes, like a crowd of "the fancy," to fight their obscene battles.

I remember meeting with an old collecting herbalist, a little eccentric in his way, who, in a conversation about indigenous herbs, asserted that he could scarcely believe the nettle to be a wild plant, at least in this country. He said that time out of mind it had been used for food, and was formerly extensively so, as well as for spinning into nettle-cloth, and could therefore now only be found in man's vicinity, or established in places he had once inhabited. One may smile at the worthy simpler's idea, but I should feel less reluctance to object to the nettle as an *ill-starred* plant than

to the truly woodland columbine.* The nettle is really perceived constantly attendant upon the skirts of civilization, as if it had claims upon human regard, or was fostered as an ancient follower; and we can no more get rid of it than an unfortunate author can hope to settle down with his book in the literary world without a stinging critique springing up at its side. So the nettle *will* sidle down upon us, and it is of little use to lift the hand to it, whether as a friend or a foe! I noticed in 1849 a meadow in the Blockhouse, Worcester, which by degrees had got surrounded by houses, until, hemmed in, it could scarcely get a peep of the distant country. It had produced most excellent crops of hay in former years, and its owner still fondly nourished it for pasture. But at this time the nettles had marked it for their own, and a most powerful irruption they had made, for full half of the field was overgrown by the tallest and rankest crop of nettles and creeping thistles (*Cnicus arvensis*) that I ever beheld in the whole course of my observation. The swathe that year was not of a very desirable kind.

The wandering botanist who re-visits old favourite localities has too often reason to remember the Horatian adage, "*Naturam expelles furcâ*"—man turns out nature with his improvements—when he looks in vain for well-remembered plants in the spots where he once gathered them. This I have often had to deplore, and the great extension of Malvern in recent years, still going on, has caused the destruction of many a pretty boggy coppice there, and the extermination of its flowers. Nature is stripped of her bridal robe of beauty, and soon—

"chok'd up with sorrow's weeds."

The lady-fern and the bog-pimpernel are destroyed, and the ragwort, dock, and goose-foot take their place.

Within a very short distance of where I now reside—a few stones' throws only—there still remained unscathed till within the last three years a beautiful little wood, called Birchin Grove, quite heathy and almost subalpine in its aspect, with its birch-trees silver-columned, service-trees (*Pyrus Aucuparia*), tall shrubs of *Rhamnus Frangula*, bushes of *Rosa tomentosa*, &c., besides various hawk-weeds, bell-flowers, and ferns, and the delicate *Convallaria majalis* in the mossy shade. Here also I had a preserve of the most remarkable and rarer *Rubi* constantly to refer to, as *R. suberectus*, *R. affinis*, *R. sylvaticus*,

* The columbine is *starred* as an introduced plant in the 'British Flora' of Hooker and Arnott.

R. carpinifolius, and others, besides a treasure among the Cryptogamic tribes. But unfortunately the estate changed hands, and a new proprietor marked the grove for destruction, ruthlessly levelling coppices and all sheltering hedges, whether for animals or plants. I went the following year after the breaking up of the soil of the grove, and one of my cherished localities was choked up with a thick yard-high growth of rank *Atripliceæ*, all of two species, *A. patula*, var. *microsperma*, and *A. erecta*. So the country changes year after year, and progression effaces the haunts and footsteps of our fathers, with their olden plants, and we are compelled to observe what new arrangements and altered cultivation bring to light. Man's operations have always a *weedy mark* inscribed upon them, as in North America the Indians are said to have called *Plantago major* the "Englishman's foot," from its always appearing in places where the colonists had encamped. So Sir Charles Lyell mentions observing the common camomile as a weed in Ohio; and Sir T. Mitchell has stated that wherever a sheep or cattle station is established in Australia, the horehound (but *quære* white or black?) is sure to spring up in great abundance.

I have thus given a few records of the springing up of plants upon broken-up soil and artificially-made ground, which, if not bearing upon the views of those botanists interested only about the differences of species, may not be without their utility to general observers, and recall similar appearances they may have witnessed. A single fact of the kind may seem trifling in itself, but in combination with others it may serve purposes to the botanical historian not at first obvious, and illustrate the workings of Nature in recurring vegetable changes.

EDWIN LEES.

Cedar Terrace, Henwick, Worcester,
March 28, 1851.

Notice of the 'Botanical Gazette,' No. 28, April, 1851.

THIS number contains two original communications, intituled as under:—

'Three Weeks' Ramble among the Clova and Braemar Mountains, in the Summer of 1850. By James Backhouse, Jun.'

'On a Monstrosity of *Daucus Carota*. By Frederick Townshend, Esq.'

The first of these papers is highly interesting, and of the same

character as those with which this excellent botanist has occasionally enriched the pages of the 'Phytologist.' The party on this occasion consisted of James Backhouse, sen. and jun., and John Tatham, of Settle, and was subsequently augmented by Professor Macgillivray and his son. The writer states that "Almost the whole of the northern part of Forfarshire is one great plateau of high table-land, intersected in every direction by deep glens and narrow precipitous ravines. To this district the appellation of Clova Mountains is given. The lower portions of the Clova valleys often present a pleasing combination of wood, heathery hills, and fine clear streams, offering few traces of the wild scenery which lies immediately behind. For many miles from their entrance the glens are broad and well cultivated; the hills sloping gradually back from the central stream; but in the upper part the gentle undulations are succeeded by a perfect level, from which the mountains rise abruptly. The great glens generally come to a sudden termination; no gradual ascent assists the traveller in gaining the mountain tops; the deep and often silent streams that water the little farms of the peasantry soon alter their aspect, and in a few hundred yards every trace of civilization vanishes."

The geological character of the district is thus described:—"The mountains around Loch Brandy, Loch Wharral and Loch Lee, as also those to the westward of Clova, appear to be formed of crumbling mica schist, while the crags of Glen Phee and Glen Dole are hard mica slate. The great Cairngorm range to the northward is granitic, as is also Lochnagar on the south side of the Dee. Between the mica slate and granite districts, intersecting veins and strata of hornblende, compact felspar, micaceous quartz, serpentine and porphyry are exposed. These rocks are chiefly met with in Canlochen Glen, Glen Callater, and on the Little Culrannoch mountain."

The list of rare plants is peculiarly rich, but almost all (if not all) of them have been previously recorded as natives of the district; little more is given than a mention of their stations till we come to the *Hieracia*, concerning which there are some excellent observations and much valuable information. *Hieracium alpinum* is described as "strongly marked by its *obconical involucre*, with *lax, obtuse, subfoliaceous, external scales*; narrow, *spatulate, obtuse, entire leaves*; and long, *white, silky pubescence*. Under cultivation these characters are still more strongly developed." *H. melanocephalum*, the *H. alpinum*, var. *melanocephalum*, of Fries? was found chiefly on the mica slate; it "differs from the preceding in having a *broad-based involucre*, *linear-attenuate scales*, and no subfoliaceous outer scales;

also by its coarsely and irregularly-toothed lanceolate leaves, black-based, shorter pubescence, and greater stature." An unknown or unascertained species was found on Ben-na-Bourd and in the ravine of the Garachary, on granite; it "differs from the character of *H. glanduliferum* of Fries mainly in having the ligules more or less ciliated. Great stress is laid by Fries on the glabrous ligules of his *H. glanduliferum*, and that plant is therefore removed by him into a section of the genus remote from *H. alpinum*. The present plant differs from *H. alpinum* in having a *globose* or subglobose *involucre*, *short, broad-based, acuminate scales*, and in being destitute of the subfoliaceous outer scales; also in its shorter, *semi-glabrous*, broadly toothed, somewhat pointed leaves, and in the profusion of glandular *black hairs* on the stem. It differs from *H. melanocephalum* in its much smaller size, short, broad-based, and *not attenuated* involucral scales, and in the form and tothing of the leaves." A second species, which the author does not name, was found on Lochnagar, on granite; it is "allied to *H. melanocephalum*, but distinguishable at first sight by its *branched scape, much larger heads*, and *obovate-lanceolate* leaves, which are more regularly toothed, and narrowed into a long, sometimes dilated petiole." *H. atratum* was found in a number of stations, on granite, "maintaining the same characters everywhere. On Ben-na-bourd and Lochnagar the plant was often branched, and when this occurred the heads were much smaller. Involucre *urceolate*; scales linear-attenuate and *black* with *glandular* pubescence; heads 1 or 2; root-leaves *few*." *H. nigrescens* of Fries occurred in the "ravine of the White Water and Canlochen Glen, on hornblende? it differs from the preceding in having broad-based, *acuminate*, subobtusely outer involucral scales, densely clothed with black glands and *soft white hairs*; in the stem bearing 1 or *several* heads, and in the densely-tufted leaves being never or very rarely glabrous." *H. rupestre* of Allioni, Koch, and Fries, a species new to the British flora, was found on the granite of Cairntoul. Of this plant the author gives the following description:—"Stem bearing root-leaves, scape-like, 1-headed, simply branched, or divided from the base into long ascending peduncles. Root-leaves ovate, linear-subulate, or elongate-lanceolate, with irregular, attenuate, acute teeth; nearly glabrous above, clothed with scattered white hairs beneath, and narrowed into long, silky, shaggy footstalks. Stem-leaves (when present) linear-lanceolate or reduced to subulate bracts. Peduncles slightly thickened upwards, clothed with stellate pubescence interspersed with black glandular hairs. Involucral scales numerous, very attenuate, clothed with black glands and soft white hairs; heads rather large

and showy. A native of Southern Europe, where it grows at an altitude of 6000 to 7000 feet." *H. saxifragum* of Fries occurred on the ravine of the White Water and Cairntoul, on mica slate? and granite; it is "a handsome species, with rigid or flexuose stems, bearing 1 or few large heads on elongated peduncles, and having lanceolate toothed root-leaves, narrowed into a short footstalk, and sessile stem-leaves, with few obtuse teeth near the middle. Its involucre have a flat or ovate base and acuminate scales, which are dark with glandular hairs in the lower part." *H. pallidum* was "abundant on the Clova Mountains and Cairngorum range. Careful comparison of specimens of this with the plant called *H. anglicum* by Fries, which is also abundant in Scotland (?)," induces the author to doubt their specific distinctness. *H. pallidum*, var. ? *persicifolium* of Fries, was found on Cairntoul, on granite; it "appears to be the plant described by Fries under the above-mentioned name, and differs from *H. pallidum* in its more slender habit, single-flowered or simply bifid stems, and in having *lanceolate*, nearly *entire*, petiolate root-leaves, *few* in number, and *perfectly glabrous*." *H. cæsium* of Fries, found on the Clova Mountains and Cairntoul, on mica slate and granite, "appears to differ from *H. murorum* in having fewer, smaller and less corymbose heads, a thick ligneous root, more elongated peduncles, and cæsius, often nearly glabrous foliage." *H. cerinthoides* of Fries was found in the gorge of the Eannach and Eagle Crag, near Loch Lee; at the head of Glen Phee, and in Glen Dole, Clova, on mica slate. "It is distinguished by its tall, rigid, erect stem, bearing 1, 2 or 3 heads on elongated, ascending or spreading peduncles; by its large, golden-yellow, ciliated ligules; acute, attenuated, glandular involucre scales, and rather soft, broadly lanceolate, acute root-leaves, which are entire or toothed near the middle, and narrowed into a shaggy dilated footstalk; also by its few (generally 2), ovate, acute, amplexicaul or semi-amplexicaul stem-leaves frequently dilated at the base." The author thinks there is no doubt that this is the *H. cerinthoides* of Don. "At first sight this plant looks different from the Teesdale *H. Iricum*, *Fries*, and is really very different from that plant when growing in rich basaltic soil: nevertheless the form of *H. Iricum* on the limestone cliffs is not (?) distinguishable from the Scotch *H. cerinthoides*. We therefore conclude that *H. Iricum* is only a luxuriant form of *H. cerinthoides*. The amplexicaul or semi-amplexicaul stem-leaves, lax outer involucre scales, and acute or subobtuse inner scales, appear to occur in both forms." *H. corymbosum* of Fries, found on heathy hillocks one mile south of the Kirktown of Clova, is "readily distinguished from *H. crocatum*, *Fries*, by its broader leaves and *large*,

compound, corymbose, leafy panicle of deep yellow blossoms. It appears to flower several weeks earlier than *H. crocatum*, along with which it grows in Teesdale."

The observations on the other plants are not of equal interest; and lest some of my readers should think for a moment that I have extracted somewhat largely from Mr. Backhouse's valuable paper, I beg to state that I have done so with that gentleman's express permission and approbation.

Mr. Townshend's monstrosity of *Daucus Carota* is very interesting. The mode of aberration is detailed in the following paragraph:—

"When in the island of Guernsey, in the month of September, 1850, I picked a curious monstrosity of *Daucus Carota*, which may, I think, throw some light upon the structure of plants of the Umbelliferous family. In this specimen nearly all the flowers of the outer whorls of the umbellules had their carpels lengthened into two free lanceolate-acuminate leaves, with their margins turned inwards, and tipped with a development of colourless cellular tissue, representing the style and stigma. Each leaf bore on its alternate edge a single ovule, attached by a lengthened funiculus proceeding from an evident development of cellular tissue (marginal placenta). In some cases there were four ovules, two on each carpel. The ovules were sometimes represented by perfect leaves with a central nerve. The stylopodium had entirely disappeared, except in one instance, where the true nature of this glandular process was shown by its being represented by a thickening of the sides of one of the styles. The stamens were perfect; the petals were very irregular, and many of a green colour, forming obovate, acute, irregularly lobed leaves."

Under the head 'Literature' the following periodicals are noticed:— 'Annals of Natural History,' Hooker's 'Journal of Botany,' 'The Phytologist,' 'Annales des Sciences Naturelles.' Report of Botanical Society of Edinburgh. I may perhaps be pardoned for remarking that the editor, in compressing the long list of contents of the March 'Phytologist' into seven lines (which feat, incredible as it may appear, he has achieved), has made some curious cross-readings, such for instance as attributing Mr. Lees's caustic remarks on the 'starred plants' of Hooker and Arnott to our esteemed friend George Stacey Gibson.

Under the head 'Miscellanea' Mr. Babington corrects an error in a former number as regards the specific name of a *Potamogeton* from Buttermere. *P. fluitans* should be *P. lanceolatus*. Mr. Babington thinks *P. fluitans* has not been found in Britain. Mr. Purchas re-

cords the finding of *Teucrium Chamædrys* on Besborough Common, near Minchinhampton, Gloucestershire. It grew amongst loose stones, intermixed with *Polypodium calcareum*, and formed a patch of perhaps twenty square yards. The habitat had much the appearance of being a genuine one.

*Notice of Hooker's 'Journal of Botany and Kew Garden Miscellany,'
No. 28, April, 1851.*

The papers in this number are intituled:—

‘Characters of Gnaphalioid Compositæ of the division Angiantheæ.
By Asa Gray.’

‘Das Königliche Herbarium zu München geschildert. By Dr. C.
F. Ph. von Martius.’

‘Second Report on Mr. Spruce’s Collections of Dried Plants from
North Brazil. By George Bentham, Esq.’

‘Contributions to the Botany of Western India. By N. A. Dalzell,
Esq., M.A.’

‘Figure and Description of a new species of *Ranunculus* from the
Rocky Mountains. By Sir W. J. Hooker, D.C.L., F.R.S.A.’

Botanical Information:—Mr. Plant’s Advertisement. (See wrapper
of the April ‘Phytologist.’)

Notices of Books:—‘Nederlandsch Kruidkundig Archief. Uitgege-
ven door W. H. de Vriese, F. Dozy en J. H. Molkenboer. Leyden.’

‘Plantæ Junghunianæ. Enumeratio Plantarum, quas, in insulis Java
et Sumatra, detexit F. Junghun. 8vo. Fasc. I. Leyden, 1850.’

‘Rhododendrons of Sikkim-Himalaya. By Dr. Joseph Hooker.
Fasc. II. Imperial folio.’ ‘The *Victoria regia*, beautifully illus-
trated with four coloured plates; by Mr. Fitch; the descriptive por-
tion by Sir W. J. Hooker.’ ‘Icones Plantarum; by Sir W. J. Hooker.’

I find nothing in this number of which an abstract would be likely
to interest the readers of the ‘Phytologist.’

*Notice of the ‘Annals and Magazine of Natural History,’ No. 40,
April, 1851.*

This number contains but two botanical papers, and as both of
these already appear in abstract in this journal, I can only give their
titles.

‘On the Composition of the Ash of *Armeria maritima* growing in different localities, with remarks on the geographical distribution of that Plant; and on the presence of Fluorine in Plants. By Dr. A. Voelcker, Professor of Chemistry in the Royal Agricultural College, Cirencester.’

‘On *Lastrea uliginosa*, *Newm.* By Thomas Moore, Esq., F.L.S., Chelsea Botanic Garden.’

Notice of the ‘Naturalist, a Popular Monthly Magazine, illustrative of the Animal, Vegetable, and Mineral Kingdoms,’ No. 2, April, 1851.

There is no allusion to the vegetable kingdom in this number, except in the title.

Notice of ‘The Gardener’s Magazine of Botany,’ Part XIV., March, 1851.

It may appear somewhat irregular to commence noticing this work with the fourteenth number, but with attempting to account for this irregularity, I will endeavour to make amends by the cordial commendation which I can now bestow on it. As the name implies, this periodical is really and truly a *gardener’s magazine of botany*: it combines with scientific botany a mass of horticultural information which will render it invaluable to the gardener; and this term is not to be considered as restricted to the nurseryman, florist, or professional gardener, but embraces a large and influential class of the population who devote their leisure hours to this delightful occupation. Its illustrations also are capital; there are five excellent copperplates, four of them coloured and one plain; and eight most elaborate wood-cuts, illustrating six genera of exotic ferns,—*Meniscium*, *Goniopteris*, *Gonophlebium*, *Cyrtophlebium*, *Niphobolus*, and *Phlebodium*,—and two species of *Cypripedium*, *C. Atsmori* and *C. guttatum*, besides seven others devoted to horticultural subjects.

The letterpress contents of this part are alphabetically indexed, a plan, I think, originated in the ‘*Gardener’s Chronicle*,’ and one which it is difficult to approve. By this means papers are always divorced from the names of their authors, and often from their own

titles. "Every hen is proud of her own chick," and I have seen no plan that communicates the contents of a periodical so simply or so rapidly to the mind as that adopted in the 'Phytologist.' I cannot reconcile myself to the want of this direction-post. However, I will extract the titles from the book itself: they are as below:—

- '*Miltonia spectabilis*, var. *Morelliana*.' Anon.
- 'Theory and Practice of Pruning. By Mr. H. Bailey.'
- 'Visits to remarkable Gardens.' Anon.
- 'A Note on the Dampsa Melon. By Mr. H. C. Ogle.'
- 'On the Culture of Gloxinias and Gesneras. By Mr. J. L. Midlemis.'
- 'Botanical Fragments,' being extracts from various sources.
- 'Inarching to supply vacancies in Fruit-trees.' From the 'Journal of the Horticultural Society.'
- '*Metrodorea nigra*.' Anon.
- 'On Variegation in Plants. By Dr. Morren.'
- 'Vines and Vine-borders. By Mr. A. Shearer.'
- 'The Hedge-plants of India.' A review.
- 'Nursery calls; Messrs. Lucombe, Pince, and Co.' Anon.
- 'Some Remarks on the agency of Manures;—humus. By Mr. J. Towers.'
- '*Lupinus pubescens* and *Hartwegii*.' Anon.
- 'The Genera and Species of Cultivated Ferns. By Mr. J. Houlston and Mr. T. Moore.'
- 'Contrasts in Landscape Gardening. By David Gorrie, Esq.' From the 'North British Journal of Agriculture.'
- 'Horticultural Society.' Report of the usual Meeting, held February 18.
- 'Fuchsia: Florists' Varieties.' Anon.
- 'The Properties of the Fuchsia. By Mr. G. Glenny.'
- 'Notes, cultural, critical, and suggestive.'
- 'New and rare Plants.'
- 'Progress of Horticulture.'
- 'Garden Hints for Amateurs.'

A glance at these titles will instantly show that the *horticultural* predominates over the *botanical*; nevertheless the botanical is sound and valuable, and the paper on exotic ferns, by Messrs. Houlston and Moore, is the best contribution to botany published in our journals during the present year. Forty species are concisely but clearly described. I heartily wish the authors may be induced to continue this excellent paper, and give us descriptions of every species of fern; it

will be a great boon to the scientific botanist, and an incalculable benefit to the cultivators of ferns.

In the present number of the 'Phytologist' I have no available space for extracts from the 'Gardener's Magazine of Botany,' and at present can do no more than heartily recommend it to my readers.

Further Remarks on Lastrea recurva.

By the Rev. W. T. Bree, M.A.

SOME readers possibly may think that enough, and more than enough, has already appeared in the pages of the 'Phytologist,' touching certain disputed species or varieties of British ferns, of which *Aspidium dilatatum* of authors may be regarded as the type or representative. Thus we have in the number for April no less than three articles, respectively by the Rev. W. S. Hore, Mr. Wilson, and Mr. White, all bearing upon the subject; over and above the pathetic remonstrance *in propria personâ* by *Lastrea recurva* in a previous number. I am not complaining of these discussions; quite the contrary; they are to me highly interesting. Agreeing, as I do in the main, with the substance of what these gentlemen have written, I feel very much inclined to add a few more words on the subject, even at the risk of being thought tedious. The group of species to which I allude, with *Aspidium dilatatum* standing at the head of them, may not improperly be termed (to use a vulgar expression) the "awkward squad" among ferns; that is to say, it forms a convenient sort of receptacle to which to refer all manner of perplexing species, which botanists do not very well know how else to dispose of. Thus we find *Lastrea dilatata* and *spinulosa*, or, in more correct phrase, *multiflora* and *spinosa*, the newly-invented *uliginosa*, the perfectly distinct *recurva*, and even *rigida*, according to some high and most respectable authorities, all lumped together as varieties of one and the same species. Let *Lastrea cristata* look well to her claims as a species, for I am half inclined to think that there are incipient suspicions arising in some quarters against *her* character too. Be this as it may, verily our old familiar acquaintance *Filix-mas* ought to consider that he has had a most lucky escape in not being transferred to the "awkward squad," seeing that *rigida* has heretofore been so served; although this latter fern is now, I believe, pretty generally admitted on all hands to be a perfectly distinct and genuine species. But confining my obser-

vations to *L. recurva*, there is a remark in Mr. Hore's paper which I would recommend to the especial notice of all in-door botanists, before they pass judgment against this fern. He says (*Phytol.* iv. 97), "But it is from an acquaintance with *L. recurva* in its natural localities that one feels satisfied that it is not a mere variety. It requires no close examination to separate it from the numberless fronds of *multiflora* in its neighbourhood: a single glance must reveal the truth." It may not be unimportant to add, for the benefit of those who form their notions of this fern from *dried* specimens only, that one, and that perhaps the most obviously striking, character of the plant is necessarily almost, if not entirely, obliterated in a *well-preserved* dried specimen. I allude, of course, to the peculiar curvature of the pinnules, the crisped appearance of the whole frond, "somewhat resembling parsley," as Mr. White truly expresses it (*Phytol.* iv. 109). This gentleman, I trust, will excuse the freedom of the following remarks, and take them as they are meant, kindly and solely with a view to elicit truth. Judging from what Mr. White says in the 'Phytologist' for April, I infer that he has studied this fern in a wild state principally, perhaps exclusively, in Sussex; of which locality I have myself had no experience. In this county, it should seem, according to Mr. White, and I have no reason to dispute the accuracy of his observation, that *L. recurva* grows principally in *dry* situations, and consequently does not attain to so large a size as it does when supplied with a greater degree of moisture. And this circumstance will account for his saying, what as a general truth I am hardly prepared to admit, *viz.*, that "the fronds never attain more than a third the size of those of *multiflora*, and are invariably less than those of *spinosa*." Now according to my own experience of this fern, I should say that, although it will, and sometimes does, grow in very dry spots,* it is yet generally a moisture-loving species. Quite sure I am, that in the neighbourhood of Penzance I used to find it plentifully in a very moist spot in one of those little valleys with a purling

* I have preserved a specimen of *L. recurva*, the entire plant, root and all, bearing five separate fronds, of which the largest, in full fructification, measures from the crown of the root to the apex just four inches and a half; scarcely so large as a good-sized frond of *Cystopteris fragilis*! This diminutive specimen I gathered on a dry hedge-bank in the neighbourhood of Penzance. Now, looking at this dried specimen by itself, apart from others by help of which to interpret it, I might possibly be somewhat puzzled to know what species to refer it to; but having gathered it myself, and seen it in a living state, a "single glance" was enough; and I have not the slightest doubt of its being no other than *L. recurva*.

streamlet running along it, which in that country are distinguished by the peculiar name of "bottoms." Again, in the North of Devon I met with *L. recurva* but in three spots, though I kept a sharp look-out for it. In one station near Ilfracombe, and a second near Barnstaple, it occupied a considerable space, forming quite a bed, upon the sloping bank of a wood immediately overhanging running water, and almost dipping its fronds in the stream. The third station (near Ilfracombe) was in a drier and more elevated situation among rocks; but here it grew very sparingly, not more than two or three plants. Then as to *size*, I can assure Mr. White that I have gathered specimens of *L. recurva* in a Cornish "bottom," the fronds of which might almost vie with those of *multiflora*. But these, I admit, are exceptions to the rule—Cornish giants perhaps we might call them. I have now before me specimens collected near Penzance, which measure rather more than twenty-four inches from the crown to the apex; and I have frequently met with fronds of still larger dimensions. I have alluded to the peculiar crisped appearance of the fronds as a striking character of this fern; one might fancy it had just come from under the hands of the barber; nevertheless I have occasionally met with specimens, influenced perhaps by difference of soil, or by degree of shade or moisture, or what not, in which this peculiar character was entirely absent; and yet, as Mr. Hore says, "a single glance would reveal the truth," for there was a *something* about the plant which, to *my* eye, proclaimed it to be *recurva* still, and nothing else. The habit of *L. recurva* is not erect like that of *spinosa*, the fronds being disposed to trail or arch. The lower pair of pinnæ are much larger in proportion to the others, than are the corresponding pair in *multiflora* or *spinosa*; and the fronds are more persistent even than those of either of the two, retaining their verdure throughout the year. I have two large pots of *L. recurva* in the greenhouse, and several plants in the open ground, the fronds of which are now (April 11) as fresh and green as they were last summer; and they usually remain so, till I cut them off to make room for their successors.

In conclusion I would observe, that I have no object whatever in making these remarks, beyond that of stating what I believe to be the truth. Having been acquainted (and, I may say, kept up an intimacy) with *L. recurva* now for just thirty-six years and a half, and having paid much attention to it in its native localities, both in Ireland, Cornwall, and North Devon, cultivating it all the while (for it has ever been a favourite with me), I find that throughout that period it has preserved its characters to a nicety. And I cannot help feeling

some surprise that any botanist *with an eye for a fern*, who will but take the trouble to look at the plant, should still pronounce it only a variety of—what shall I say—multiflora, or spinosa, or &c., &c.? Along with Mr. Hore, I regard it as perhaps “the most beautiful and lovely, as well as the most distinct, of our indigenous ferns.” I may add, that old Mr. James Dickson, no mean authority in a cryptogamic controversy, was well acquainted with *L. recurva*, having procured it in Sussex, and cultivated it in his garden of choice things at Croydon; and that he ever regarded it as an undescribed and distinct British species.

W. T. BREE.

Allesley Rectory, April 11, 1851.

Botanical Society of London.

Friday, April 4, 1851. Arthur Henfrey, Esq., V.P., F.L.S., in the chair.

Various donations were announced.

The Rev. T. G. Carter, of Wenden, Saffron Walden; Mr. J. T. Syme, of Edinburgh; Mr. W. Gourlie, jun., of Glasgow; and Mr. P. Keir, of London, were elected members.

Mr. G. E. Dennes, the Secretary, exhibited specimens of *Ranunculus tricophyllus*, *Chaix*, collected by Mr. J. T. Syme at Dunsorpie Loch, Edinburgh, in June last. Also specimens of *Myosotis palustris*, var. *strigulosa*, Reich., collected by the same gentleman at Duddington Loch, Edinburgh, in August, 1850.

Other interesting plants, which had been received from members and other botanists for the ensuing distribution of duplicates, were also exhibited, but their names have been entered in the third edition of the ‘London Catalogue of British Plants,’ published by the Society.—*G. E. D.*

Botanical Society of Edinburgh.

March 13, 1851. Professor Balfour, President, in the chair.

The following donations were announced:—‘Botanical Gazette,’ from the Editor; British plants from Dr. Balfour, Mr. Sibbald, and Mr. Murchison, and Swiss plants from Mr. Stark.

The following papers were read:—

1. 'On *Lastrea uliginosa*, *Newm.* By Thomas Moore, F.L.S.' In this communication the author begins by stating that he has had ample opportunities of examining this fern, both in a dried state and under cultivation, and finds it sufficiently distinct in a growing state to be separated without hesitation from the allied species. Still two questions suggest themselves. First, Is it really new to England?—and secondly, Is it specifically distinct? To both these he replies in the negative; yet he considers that the existence of such an intermediate form justified Linneus and others of the older botanists in having included under one species *spinosa* and *cristata*. "The existence of a fern exactly intermediate between them, as *uliginosa* is, and differing from both in no character whatever, seems to explain all the doubts and difficulties, the 'great confusion,' as Newman has it, respecting the crested fern." In support of the view that *uliginosa* is not new to England the author says he "shall merely quote Newman, who, writing some years since of *L. spinosa*, remarks, 'it occurs frequently in marshes, and there, mingling with *cristata*, so closely approaches it in appearance that I have found the greatest difficulty in separating them.' " As to the absence of characters sufficient to justify the raising *uliginosa* to the rank of a species, Mr. Moore observes that different opinions will no doubt be held. He continues, "From the first it has appeared to me as being intermediate between the two species just named [*spinosa* and *cristata*], but before having seen the barren fronds, which the plant, I believe, constantly produces, I was led to think it more closely allied to *spinosa* than to *cristata*. Mr. Lloyd himself thinks it intermediate between these two kinds; and Mr. Newman calls it 'almost precisely intermediate,' which in fact it is. Its relationship thus seems clear enough; but I do not agree in the conclusion which has been drawn, namely, that being thus intermediate, it cannot be referred to either species as a variety, and must either combine them into one, or itself be regarded as a species." Mr. Moore then observes that its more acuminate, more divided, more serrated, more aristate pinnules, which have been correctly said to separate it from *cristata*, unite it to *spinosa*, and the adnate, decurrent pinnules, together with the outline of the barren fronds, which separate it from *spinosa*, unite it to *cristata*. The erect, rigid habit, obovate, diaphanous, concolorous scales, entire, eglandulose involucre, are common to both the proximate species: but the more equal distribution of sori over the frond, described as a character of *uliginosa*, is unsound, since undoubted specimens of *spinosa* occur in

which every pinna is thoroughly furnished with perfect sori. Hence there is no tangible specific character yet pointed out by which to distinguish uliginosa as a species, although this may possibly be the truth; but regarding it as a variety only, there are more points of structural detail connecting it with cristata than with spinosa. In the form and mode of incision uliginosa approaches spinosa, and differs from cristata, while in venation, a character of higher value, "it exactly coincides with cristata, and absolutely differs from spinosa:" in the venation it very closely agrees with cristata, but differs from spinosa; hence it is proposed to regard it as a variety of cristata, thus:—

"*Lastrea cristata*. Fronds narrow, linear-oblong, sub-bipinnate; pinnæ elongate triangular, with oblong, serrated, decurrent pinnules, the lower crenately, often deeply, lobed; lateral veins of the pinnules with several branches.

"*β. uliginosa*. (Fertile fronds) pinnules oblong, pointed, deeply lobed, somewhat aristato-serrate, the lowest sometimes scarcely decurrent = *Lastrea uliginosa*, *Newman*, *Phytol.* iii. 679."

The plant usually, if not constantly, produces dissimilar barren and fertile fronds, the former of which are not distinguishable from those of the normal cristata, nor the latter from those of true spinosa, of similar size.*

Dr. Balfour exhibited specimens of *L. cristata*, *spinosa*, and *uliginosa* to illustrate the paper.

Sir Walter Trevelyan noticed the occurrence of *L. spinosa* in woods near Dingwall.

2. 'Notice of British Hieracia. By James Backhouse, jun.' In this communication the author gave an account of several Hieracia found by him in the Highlands of Scotland, as well as in Teesdale. He stated that the plant which he had formerly noticed as *H. Oreades* turned out on minute comparison with Swedish specimens to be *H. saxifragum* of Fries's new 'Monograph.' The plant is found in the ravine of the White Water at the head of Glen Dole, Clova, on the eastern slope of Cairntoul, and also in Teesdale. During a highland

* I am indebted to the kindness of Mr. Moore for the means of giving this complete abstract of his paper. I have throughout altered the name *spinulosa* to *spinosa*, because the author himself informs me that he invariably uses this name to express the *spinosa* *Newm.*, not the more comprehensive *spinulosa* *Hook. & Arn.*

excursion last summer the author found abundance of *H. atratum*, *Fries*, and a few specimens of the true *H. nigrescens*, *Fries*, of which plant *Fries* states he has never seen authentic British specimens. From careful comparison of Teesdale and Scotch specimens of *H. iricum*, *Fries*, and *H. cerinthoides*, Mr. Backhouse is inclined to consider the former (as Dr. Arnott suggests) to be a luxuriant *form* of the latter, slightly changed in character from growing on mica-slate or basalt. The amplexicaul or semi-amplexicaul character of the cauline leaves is inconstant (sometimes they are nearly sessile), and the acuteness or bluntness of the involucral scales is variable. Last autumn he gathered in Teesdale a plant which agrees well with *H. crocatum*, var. *angustatum* (*Fries*'s 'Monograph'). It flowers much later than *H. crocatum*, *latifolium* (the ordinary form), with which it grows, but passes over many weeks sooner. The form of the leaves is very remarkable. Mr. Backhouse is cultivating both, in the hope of ascertaining the distinctive character, if any, thoroughly. The following species have been gathered in Teesdale:—*H. gothicum*, *Fries*, *H. crocatum* and its var., *H. dilatatum*, *Fr.*, *H. corymbosum*, *Fr.*, *H. saxifragum*, *Fr.*, *H. tridentatum*, *Fr.* The paper was illustrated by a complete series of native and cultivated specimens, which had been kindly transmitted for inspection. The author is continuing his researches on the subject of the British *Hieracia*, and he will be glad to receive specimens even of the common species.

3. On the Berwickshire Station for *Anacharis Alsinastrum*. By Dr. Johnston.' Dr. Johnston writes, "As regards the *Anacharis*, my tale is this:—For thirty years and more I have herborized in that part of the Whiteadder where the plant is now common. For some years I was accompanied in my searches by Dr. Philip MacLagan, and the specimens of *Potamogeton* in my herbarium were principally collected in a place now choked up with *Anacharis*. Mr. Henderson, surgeon in Chirnside, has also often, and again and again, and season after season, botanized in this river, and never saw the plant until I drew his attention to it. Now, I maintain that it was impossible the plant could have escaped our notice had it been there. It is no pigmy; in fact it is a plant that attracts notice. When first I found the *Anacharis* in the Whiteadder, I could discover only two or three tufts of it. I was fishing and following the water: I could see no more of the plant anywhere near. Now, however, the place is actually full of it; last year they had to get iron rakes to clear it away, and cart-loads were drawn out. So at Whitehall I found it first in only one creek, but there abundantly. When I wrote to Mr.

Henderson he was incredulous, for the very spot was one he knew as the locality of other plants. He not only got the *Anacharis* there the following summer, but he found it in several places adjacent. Now from Whitehall to Gainslaw Bridge the *Anacharis* is by far the commonest plant in the Whiteadder; and its minute flowers whiten the surface of the water. It is to me quite plain that it is of recent introduction. My explanation is this:—The plant has been introduced into the lake at Dunse Castle with alien aquatics, for in the lake there are several foreigners. Then it had multiplied itself there until it took thick possession of some parts of the lake. Now, while they were paddling amongst this herbage, some small bits may have adhered to the plumage of the wild ducks and other aquatic birds, and by their means they have been carried to the Whiteadder. This, as the crow flies, is about two miles from Dunse Castle, but Whitehall is six miles distant.”

Alluding to the facts mentioned by Dr. Johnston, Mr. G. Lawson stated that the *Anacharis* had appeared in a somewhat similar manner in the neighbourhood of Derby. Mr. Joseph Whittaker, of Breadsall, from whom Mr. Lawson had received a communication on the subject, had been for some years engaged in the examination of the *Potamogetons* of the neighbourhood, but had never met with the *Anacharis* until recently, although it is now in great abundance.

4. ‘Report on the state of Vegetation in the Edinburgh Botanic Garden from February 14, to March 13, 1851. By Mr. M‘Nab.’

Dates of Flowering.

	1851..	1850.
<i>Cornus mascula</i> - - - -	February 14	
<i>Anchusa sempervirens</i> - - - -	„ 14	
<i>Primula denticulata</i> - - - -	„ 15	February 23
<i>Holosteum umbellatum</i> - - - -	„ 16	
<i>Orobis vernus</i> - - - -	„ 17	„ 23
<i>Adonis vernalis</i> - - - -	„ 18	March 16
<i>Tussilago Farfara</i> - - - -	„ 19	February 27
<i>Nordmannia cordifolia</i> - - - -	„ 20	„ 28
<i>Hyoseyamus Scopolia</i> - - - -	„ 24	March 1
<i>Arabis præmorsa</i> - - - -	„ 26	
<i>Erythronium Dens-canis</i> - - - -	March 1	„ 11
<i>Aubretia grandiflora</i> - - - -	„ 1	„ 24
<i>Gagea lutea</i> - - - -	„ 2	„ 20
<i>Aubretia deltoidea</i> - - - -	„ 3	„ 21
<i>Kerria japonica</i> - - - -	„ 4	
<i>Saxifraga crassifolia</i> - - - -	„ 4	„ 20
<i>Mercurialis perennis</i> - - - -	„ 4	

Dates of Flowering.

		1851.		1850.
Ribes sanguineum (first flower opened)	- -	March	5	March 11
Narcissus pumilus	- - -	"	5	" 4
Hyacinthus orientalis	- - -	"	5	April 8
Narcissus Tazetta	- - -	"	6	
Scilla bifolia, cærulea	- - -	"	6	March 13
Scilla bifolia, alba	- - -	"	8	" 14
Omphalodes verna	- - -	"	10	
Lamium garganicum	- - -	"	10	
Hyacinthus botryoides	- - -	"	11	" 18
Viola suavis	- - -	"	12	
Fritillaria imperialis	- - -	"	13	" 20
Scilla praeox (Canonmills Cottage)	-	February 20		

Mr. M'Nab laid before the meeting a record of thermometrical observations, made at the Botanic Garden, in connexion with the observations on the flowering of plants.

Mr. M'Nab also presented the following register of the dates of flowering of plants in the open air at Cambridge, as observed by Mr. Stratton, of the Cambridge Botanic Garden:—

<i>Botanic Garden, Cambridge.</i>	<i>Water Beach, near Cambridge.</i>
February 5. <i>Potentilla Fragariastrum</i>	December 24. <i>Eranthis hyemalis</i>
" 8. <i>Leucojum vernum</i>	January 4. <i>Helleborus niger</i>
" 13. <i>Saxifraga oppositifolia</i>	February 1. <i>Anemone coronata</i>
" 13. <i>S. oppositifolia, alba</i>	" 3. <i>Anemone apennina</i>
" 15. <i>Mercurialis perennis</i>	" 3. <i>Potentilla Fragariastrum</i>
" 17. <i>Scilla bifolia</i>	" 8. <i>Pulmonaria officinalis</i>
" 19. <i>Ranunculus Ficaria</i>	" 8. <i>Epimedium macranthum</i>
" 19. <i>Corylus Avellana</i>	" 10. <i>Orobus vernus</i>
" 22. <i>Saxifraga hirta</i>	" 10. <i>Scilla bifolia</i>
" 22. <i>Aubretia purpurea</i>	" 10. " <i>sibirica</i>
" 22. <i>Draba cuspidata</i>	" 17. " <i>præcox</i>
" 23. <i>Geum urbanum</i>	" 20. <i>Alnus glutinosa</i>
" 25. <i>Draba aizoides</i>	" 22. <i>Ulex europæus</i>
" 25. <i>Lamium purpureum</i>	" 22. <i>Draba brachystemon</i>
" 26. <i>Leucojum pulchellum</i>	" 22. <i>Cornus mascula</i>
March 3. <i>Petasites vulgaris</i>	" 22. <i>Hyacinthus orientalis</i>
" 3. <i>Narcissus Tazetta</i>	" 22. <i>Ranunculus Ficaria</i>
" 3. <i>Hermione polyantha</i>	March 5. <i>Narcissus minor</i>
" 5. <i>Narcissus Pseudo-narcissus</i>	" 5. " <i>Pseudo-narcissus</i>
" 5. <i>Kerria japonica</i>	" 6. <i>Leucojum vernum</i>
	" 6. <i>Nordmannia cordifolia</i>
	" 6. <i>Scopolia carniolica</i>
	" 7. <i>Hyoseyamus orientalis</i>
	" 7. <i>Dianthus barbatus</i>
	" 7. <i>Malva crispa</i>
	" 8. <i>Euphorbia peplus</i>

Mr. Evans observed the first flowers of the Moor Park apricot to expand on an open wall in the experimental garden on the 21st of February. The earliest flower produced on the same tree last year opened on the 1st of March. A standard plum also produced flowers on the 22nd of February last.

Mr. W. Anderson, Tunstall Rectory, Sittingbourne, Kent, likewise forwarded a list of plants observed by him in flower at that place on the 1st of March. He remarks:—"Notwithstanding the mildness of the season, vegetation is much more backward this spring than it was at the same periods during the last two years, by at least a fortnight."

The following specimens were exhibited from Mr. Kirk, Coventry.—*Potamogeton zosteraceus*, *Bab.*, from Stokeheath, near Coventry, in its spring and summer states; *Potamogeton zosteræfolius*; *Poterium muricatum*, from Kenilworth; *Acorus Calamus*, Arbury Hall; *Symphytum bullatum*, Allerley, naturalized; *Secaline cærulea*, on soil thrown out from the bottom of a canal, Coventry.

Mr. M'Nab exhibited flowers of *Camellia japonica*, var. *pæoniiflora*, from a plant growing on the open wall of the Botanic Garden. The plant is ten feet in height, and the spread of its branches is in all fourteen feet. There are at present 560 flower-buds on it. No other variety has been grafted upon the plant; but some of the flowers exhibited were completely white, others completely pink, others with one half white and the other half pink, and some with shades of white and pink in the same petal.

Messrs. P. Lawson & Son sent for exhibition a collection of beautiful and correct wax models, showing the appearance of the various cultivated potatoes, beans, peas, kidney-beans, and onions; also specimens of woods, so cut and arranged as to exhibit at one glance the transverse and longitudinal sections of each tree, both polished and rough. The models and specimens illustrated the mode in which Messrs. Lawson purpose to supply articles for the Exhibition of 1851. Messrs. Lawson also exhibited a large collection of coloured drawings, in which the varieties of cultivated vegetables were accurately delineated. The drawings embraced varieties of turnip, carrot, radish, mangold-wurzel, beet, onion, cabbage, &c.

Mr. Stark exhibited a large cone of *Araucaria Bidwillii*, along with seeds, from Moreton Bay. The cone was presented by Mr. Stark to the museum at the Botanic Garden.

Richard Innes, Esq., 8, Roxburgh Street, was elected a Fellow.

Thursday, April 10, 1851. Professor Balfour, President, in the chair.

The following donations to the library were announced:—Transactions and Reports of the General Society of Natural History of Switzerland, and of the Society of Natural History at Bonn.

Dr. Balfour stated that Messrs. Lawson & Son had presented fifty-six specimens of woods to the museum at the Botanic Garden.

Mr. M'Nab exhibited a stem of *Statice arborea*, from Professor Syme's garden at Millbank, nearly an inch and three quarters in diameter; also a specimen of the stem of *Caryota urens*, which had been cut down last year in the Botanic Garden.

Mr. M'Nab exhibited, from the garden of Dr. Neill, a large specimen of *Gentiana verna*, in full flower, in a pot. The patch was eight inches in diameter, and the number of flowers was 106; when first brought into the room all the flowers were closed, but under the influence of gas-light they opened, and in the course of an hour they were fully expanded. Mr. James Thomson (Dr. Neill's gardener) was requested to make a few experiments on the effects of light and heat upon the plant. The following particulars have since been furnished by him:—

1. On the 11th of April the gentian was placed in a warm plant-stove, the temperature of which was about sixty-three degrees, and the flowers soon opened (in the absence of light), and continued open so long as exposed to the high temperature.

2. On the 12th of April the plant was removed to a cool room (temperature forty-eight degrees), in which a jet of gas was burning. In this situation the flowers likewise opened about an hour after the plant was put in.

3. On the 14th of April, about mid-day, the plant, in full bloom, was taken to a cool dark cellar, where the flowers closed almost immediately.

4. On the 15th of April it was placed in a cold dark place, from six a.m. till two p.m., during which period the flowers were all partially closed; the plant being then exposed to light, the flowers expanded in about half an hour.

Mr. M'Nab exhibited a flowering specimen of *Lathræa squamaria*, from Dr. Neill's garden at Canonmills, where it has been blooming since the beginning of March. This curious root-parasite was received by Dr. Neill during August, 1846, from the Portugal laurel shrubberies at Melville Castle, where it was introduced many years previously, from the plantations at Arniston. The plants sent to

Canonmills Garden were placed respectively on the roots of pear, filbert, and hazel; on the latter only did it succeed, and it now covers a space of ground three feet in diameter, annually producing numerous flower-stems, as large and perfect as in its native locality.

Mr. M'Nab also exhibited a flowering plant of what is now generally cultivated in the British gardens under the name of *Bryanthus erectus*. The original plant was produced during the year 1841, by Mr. James Cunningham of the Comely Bank nurseries, from seed of the *Phyllodoce* (*Menziesia*) *empetriformis*, fertilized with the pollen of *Rhododendron chamæcistus*. This mule has therefore been figured under a generic name which it is not entitled to (see Paxton's 'Flower Garden,' No. 7, Sept. 1850). It is, however, exceedingly beautiful, and flowers abundantly in the open border during the months of May and June, and is one of the few instances we have of a hybrid raised between two distinct genera.

The following communications were read:—

1. 'On a Supposed New Species of *Rubus*. By Fenton J. A. Hort, B.A., Cambridge.' In the commencement of the paper the author remarks:—"At a time when descriptions of brambles, published by botanists whose qualifications have been fully tested and acknowledged in other fields, are received with incredulity and even derision, those who possess no such advantages have little right to expect a gentler and more charitable treatment. If, therefore, it were allowable to be guided wholly by personal consideration, I should not venture to add another species to our already crowded list; but cowardice and mock-modesty are as unjustifiable in science as in anything else." After making some observations on the importance of studying minutely and carefully all the forms and varieties of this difficult genus, the author proceeds to describe a new species, which he calls *Rubus imbricatus*. It belongs to the group possessing subglabrous, eglandular, rooting barren stems, and stout leathery leaves, and is closely allied to *R. affinis*, *cordifolius*, and *incurvatus*. The plant flowers early, nearly a month before its true allies. A full description of the species was given, with the characters by which it is distinguished from the others in the same group.

Dr. Balfour stated that a large collection of British Rubi had been recently sent to the Edinburgh Botanic Garden, from the Cambridge Garden, in order that the changes produced by cultivation might be observed.

2. 'Notice of *Narcissus* (*Ajax*) *lobularis*, Haw. By John T. Syme, Esq.' Mr. Syme exhibited a plant of this *Narcissus* in flower, the

bulb of which he had received from the Rev. W. T. Bree, Allesley Rectory, who cultivated it in his garden from roots found apparently wild near Tenby, in Pembrokeshire, by the late Joseph Boulton, Esq. It differs from *N. Pseudo-narcissus* in having the cup divided into six distinct lobes, and of the same colour as the segments of the perianth, which are broadly ovate and rather sharply acuminate. It is a very handsome plant, and unlike any species known in gardens.

Dr. Balfour read a communication from the Rev. W. Smith, of Lewes, giving a detailed account of his examination of the Diatomaceous peat from Cantyre, referred to in a previous report. The following is a list of the species detected by him :—

<i>Epithemia sorex</i>	<i>Encyonema prostrata</i>
„ <i>zebra</i>	<i>Gomphonema acuminatum</i>
„ <i>gibba</i>	„ <i>dichotomum</i>
„ <i>granulata</i>	<i>Navicula major</i>
<i>Eunotia diodon</i>	„ <i>viridis</i>
<i>Himantidium pectinata</i>	„ <i>radiata</i>
<i>Fragilaria capucina</i> and <i>hyemalis</i>	„ <i>oblonga</i>
<i>Cyclotella operculata</i>	„ <i>amphisbæna</i>
<i>Melosira orichalcea</i>	„ <i>placentula</i>
<i>Campylodiscus costatus</i> , n. s.	„ <i>gibberula</i>
<i>Surirella biseriata</i>	„ <i>gibba</i>
„ <i>splendida</i>	„ <i>ovalis</i>
<i>Cymatopleura solea</i> , n. g.	„ <i>attenuata</i>
„ <i>elliptica</i>	<i>Stauroneis phœnicenteron</i>
<i>Synedra ulna</i>	„ <i>gracilis</i>
<i>Cocconeis pediculus</i>	„ <i>acuta</i> , n. s.
<i>Cymbella cuspidata</i>	„ <i>cardinalis</i>
<i>Cocconema lanceolatum</i>	<i>Amphora ovalis</i>
„ <i>cymbiforme</i>	<i>Tabellaria fenestrata</i>
„ <i>cistula</i>	

The above are all of them *fresh-water* species; in the inner deposit occur numerous spicula of *Spongilla fluviatilis*. One of the rare species mentioned above is *Stauroneis acuta*; this Mr. Smith has also found in the Irish deposit: it is figured in the ‘Histological Catalogue of the College of Surgeons,’ plate xii. f. 28, having been collected by Dr. Mantell’s son, at Plymouth, New Zealand. A drawing was given of this species, and a specimen was sent for the microscope. The communication was illustrated by beautifully prepared specimens, which were exhibited under the microscope.

Dr. Balfour likewise read a communication from Dr. James Duncan, on the supposed poisonous effects of the seeds of *Abrus precatorius*. This communication had reference to the case of three children

in a family, who, after swallowing some of the seeds of *Abrus precatorius*, well known as the red West Indian peas, with black specks on them, had been attacked with vomiting, giddiness, and other symptoms of poisoning. The peas had been swallowed about three in the afternoon, and the symptoms developed themselves about eight in the evening. Under the use of emetics the children all recovered. It was remarked that considerable difference of opinion exists as to the qualities of these peas. Dr. M'Fadyen in his 'Flora of Jamaica' says, that they are merely indigestible, and not poisonous; while Lindley and others state that they belong to the narcotic division of Leguminous plants. The present case confirms the latter view, and points out the necessity of caution in allowing children to amuse themselves with these seeds.

Mr. M'Nab gave the following report on the state of vegetation in the Edinburgh Botanic Garden, from the 14th of March till the 10th of April, 1851. He remarked that about a dozen of the plants noted as in flower before this time last year, have not yet flowered.

Dates of Flowering.

	1851.	1850.
<i>Draba aizoides</i> - - - - -	March 14	March 15
<i>Puskenia scilloides</i> - - - - -	" 15	
<i>Leontodon Taraxacum</i> - - - - -	" 16	
<i>Acacia affinis</i> - - - - -	" 16	
<i>Saxifraga oppositifolia</i> - - - - -	" 16	" 15
<i>Silene pendula</i> - - - - -	" 16	
<i>Primula nivalis</i> - - - - -	" 16	" 1
<i>Scilla bifolia rubra</i> - - - - -	" 17	
<i>Corydalis solida</i> - - - - -	" 19	" 16
<i>Vesicaria sinuata</i> - - - - -	" 20	
<i>Corydalis cava</i> - - - - -	" 21	" 16
" <i>nobilis</i> - - - - -	" 22	
<i>Anemone nemorosa</i> - - - - -	" 24	" 9
<i>Narcissus moschatus</i> - - - - -	" 26	" 24
<i>Scilla sibirica</i> - - - - -	" 26	
<i>Narcissus Pseudo-narcissus</i> - - - - -	" 27	" 24
<i>Valerianella congesta</i> - - - - -	" 27	
<i>Brassica napus</i> - - - - -	" 27	
<i>Orobis venosus</i> - - - - -	" 28	" 24
<i>Hyoseyamus orientalis</i> - - - - -	" 28	
" <i>physaloides</i> - - - - -	" 28	
<i>Saxifraga virginica</i> - - - - -	" 28	
<i>Anemone hortensis</i> - - - - -	" 28	April 6
<i>Narcissus jonquilla</i> - - - - -	" 29	
<i>Alyssum saxatile</i> - - - - -	" 29	" 3

Dates of Flowering.

						1851	1850
<i>Ficaria ranunculoides</i>	-	-	-	-	-	March 30	
<i>Narcissus bicolor</i>	-	-	-	-	-	„ 31	April 2
<i>Pulmonaria officinalis</i>	-	-	-	-	-	April 1	„ 4
<i>Viola pulmonense</i>	-	-	-	-	-	„ 1	„ 1
<i>Doronicum pardalianches</i>	-	-	-	-	-	„ 2	„ 6
<i>Dalibarda geiodes</i>	-	-	-	-	-	„ 3	March 30
<i>Primula ciliata, purpurata</i>	-	-	-	-	-	„ 4	
<i>Luzula Forsteri</i>	-	-	-	-	-	„ 4	
„ <i>pilosa</i>	-	-	-	-	-	„ 5	
<i>Anemone coronaria</i>	-	-	-	-	-	„ 5	
<i>Primula marginata</i>	-	-	-	-	-	„ 5	„ 21
<i>Sesleria caerulea</i>	-	-	-	-	-	„ 5	
<i>Narcissus incomparabilis</i>	-	-	-	-	-	„ 5	April 2
<i>Scilla italica</i>	-	-	-	-	-	„ 6	„ 8
<i>Hierochloe borealis</i>	-	-	-	-	-	„ 7	„ 4
<i>Euphorbia Epithimoides</i>	-	-	-	-	-	„ 7	„ 5
<i>Hesperis arabidifolia</i>	-	-	-	-	-	„ 7	„ 2
<i>Alopecurus nigricans</i>	-	-	-	-	-	„ 8	March 24
<i>Saxifraga adscendens</i>	-	-	-	-	-	„ 8	
<i>Corydalis capnoides</i>	-	-	-	-	-	„ 9	„ 21
<i>Saxifraga Sternbergii</i>	-	-	-	-	-	„ 9	
<i>Anemone apennina</i>	-	-	-	-	-	„ 9	April 3
<i>Pulmonaria virginica</i>	-	-	-	-	-	„ 9	„ 3
<i>Carex montana</i>	-	-	-	-	-	„ 10	„ 9

Mr. M'Nab added the following list of plants observed in flower in the open border at Comely Bank, on the 9th of March, 1851, the species being different from those mentioned in the foregoing list:—

<i>Dentaria pentaphylla</i>	<i>Anemone ranunculoides</i>
<i>Corydalis bracteata</i>	<i>Epigæa repens</i>
<i>Iris reticulata</i>	<i>Helleborus orientalis</i>
<i>Bulbocodium vernum</i>	<i>Atropa Mandragora</i>
<i>Cochlearia acaulis</i>	

In connexion with the above observations on the flowering of plants, Mr. M'Nab presented a record of thermometrical observations made in the Botanic Garden during the same period.

The following new members were elected:—Ordinary Fellows: J. Nickle Fanning, Esq., Seaside House, Seafeld, Leith; Robert Withers, Esq., 8, Elm Place, Bath. Associate: Mr. James Stratton, Botanic Garden, Cambridge.

Microscopical Society of London.

Anniversary Meeting, February 12, 1851. Dr. Arthur Farre in the chair.

The Assistant Secretary read the following Report of the Council:—

“According to annual custom, the Council have to make the following Report on the state and progress of the Society during the past year. The number of Members at the last Anniversary was, Ordinary Members, 141; Associates and Honorary, 5; giving a total of 146. Since that time there have been elected 20, making a total of 166. This number must, however, be reduced by 3,—2 deceased and 1 resigned, making a final total of 163; being an increase of 17 upon the number at the last Anniversary. The rooms have been opened on Wednesdays during the session, under the usual regulations. The Cabinet of Objects and the Library have been increased by various donations. There are also in the possession of the Society various Drawings and Diagrams, relating chiefly to papers read at the meetings of the Society; together with copies of the several parts of the ‘Transactions.’ The Council have also to state, that the arrangements made for facilitating the mutual exchange of Objects among the Members, have been found extremely beneficial, not only to those making such exchanges, but also to the Society itself. They have also to express their regret, that the privilege enjoyed by the Members of making use of the Society’s Instruments, &c., on the Wednesday, has not been so fully appreciated by them during the past year as the Council could have desired.”

The Assistant Secretary read the following Report of the Auditors:—

“We have examined the Treasurer’s Account for the past year with the vouchers, and find the balance in hand to be £85 6s. 10d., the whole of which is at the bankers’.”

The President then addressed the meeting, giving a retrospect of the past year, which included those abstracts of papers which have already appeared in the ‘Phytologist,’ and congratulating the Society on its present state and future prospects.

The ballot was then taken for the election of Officers for the ensuing year, when Dr. Arthur Farre was elected President; N. B. Ward, Esq., Treasurer; John Quekett, Esq., Secretary; Mr. John Williams, Assistant Secretary; and Messrs. Gosse, Handford, Lankester, and Woodward, new Members of Council.

March 19, 1851. Dr. Arthur Farre, President, in the chair.

A paper by George Shadbolt, Esq., entitled 'Observations upon Oblique Illumination, with a description of the author's Sphæro-annular Condenser,' was read.

After some preliminary remarks, Mr. Shadbolt stated that the subject of oblique illumination might be considered as comprehended under two distinct heads, *viz.*, illumination by oblique light on one side only, and illumination by opposing rays, so as to obviate any shadow. The former mode has been long employed by microscopists, but the latter has been suggested and carried out only recently, by Mr. Wenham, in his parabolic condenser. The author considered that by far the most advantageous mode of applying the first of these methods, was by means of the cleverly-constructed prism of M. Nacet, the effects of which are far superior to the old method of turning the mirror on one side, and the instrument also possesses some other obvious advantages. In this method of observing objects the minute ridges are rendered clearly visible by means of their shadows. But in order to view certain objects in the most advantageous manner, it is desirable to get rid of the shadow entirely, and this, as well as a far more brilliant illumination, is effected by the parabolic condenser constructed by Mr. Wenham, which is fully described in a late part of the Society's 'Transactions.' There are, however, certain practical difficulties in constructing a paraboloid correctly, which render it by no means an easy task, and the author was in consequence induced to devise his annular condenser, also described in a recent part of the 'Transactions.' Still, however, the action was not perfectly satisfactory; and Mr. Shadbolt, after many trials, has succeeded in producing an arrangement of sphærical curves, one centre only being excentric, which fully answers his expectations, and is easy of manufacture; this he names the sphæro-annular condenser. It consists of a portion cut off from a sphere of glass, the lower part being flat and parallel to the object, and the upper surface concave. Its action is as follows:—The light is reflected from the surface of the plane mirror in parallel rays, which, falling perpendicularly on the base of the condenser, suffer no refraction, but pass on to the convex surface of the sides, where, as the angle of incidence is in no case less than 45° , they are totally reflected, and thus brought to a focus in the best place for producing this kind of illumination. Diagrams explaining the principles of the construction of this instrument, and the mode of its action, were also exhibited and described.

A paper by H. Deane, Esq., 'On a New Medium for Mounting fresh or moist Animal and Vegetable Structures,' was also read.

After enumerating various disadvantages found in mounting objects, both in the fluids hitherto employed and in Canada balsam, the author went on to describe a substance which, in his opinion, would entirely obviate the greater part, if not the whole, of these, and which also appears to possess all the qualities required in a medium for mounting objects in the modes referred to. It is composed of the following ingredients:—Gelatine, 1 oz.; water, 4 oz.; honey, 4 oz.; rectified spirits of wine, $\frac{1}{2}$ oz.; kreosote, 6 drops. The gelatine is to be soaked in water until soft; the honey is to be raised to the boiling heat in another vessel, and added to the moist gelatine; the whole is then to be made boiling hot; when it has somewhat cooled, but is still perfectly fluid, the kreosote and spirits of wine previously mixed together are to be added; the whole is to be filtered through fine flannel. When cold the composition is in the form of a very stiff jelly, which on being slightly warmed becomes perfectly fluid. He concluded with some practical directions for its use, and also by an enumeration of some of its advantages over former media for mounting objects.

April 16, 1851. Dr. Arthur Farre, President, in the chair.

Robert Semple Frere, Esq., Bransby Blake Cooper, Esq., and Wm. R. Morris, Esq., were balloted for and duly elected members of the Society.

Dr. Asa Gray, Professor of Natural History in Harvard University, Cambridge, Massachusetts, was balloted for and duly elected an honorary member of the Society.

A paper by W. Ladd, Esq., 'On an Improved Adjustment for a Microscope,' was read.

After pointing out the disadvantages of the ordinary rack and pinion movement, Mr. Ladd described the improvement he had made, which consists of the substitution of a steel chain, known as a "fusee chain," for the rack, and a steel pin or axis for the pinion. The ends of the chain are attached to the top and bottom of the sliding bar which supports the body of the microscope, passing two or three times round the steel pin or axis, which is furnished with a milled head. The motion thus produced is exceedingly smooth and even, and is not liable to the disarrangement on account of wear, which forms the greatest objection to the rack and pinion. A microscope fitted up with this movement was afterwards exhibited to the meeting.

A paper by Messrs. Hassall and Coppin, being a description of

three species of marine Zoophytes, was also read. These are three new species of corallines of the genera Coppinia (Hassall, 'Zoologist,' No. 69, p. 2223), Sertularia, and Campanularia. They are respectively named Coppinia mirabilis, Sertularia gracilis, and Campanularia serpens, and are found on the English and Irish coasts. Detailed descriptions were given, and drawings exhibited in illustration of the same.

A third paper, being a translation of a letter from M. Nobert, giving a description of a glass plate, having on it twelve systems of parallel lines, was read. These systems of lines were distinguished by the letters A, B, and C, to M, the latter being the finest; and the distances in each set were expressed with the most scrupulous exactness in Paris lines, as being, in system A, 0."000375 to system M, which was the finest, 0."0001281. The other systems were of intermediate degrees of fineness. By using this plate in a particular manner, fully described in the paper, the systems of lines from A to G present an aerial spectrum of the prismatic colours, A being deep red and G a deep violet; and as no colour appears in the remaining systems (from H to M), the author considers that the distance of the lines in these systems is nearer than the length of the smallest (the violet) undulations of light. Upon turning the plate, and arranging it in a rather different manner, coloured representations of the whole of the twelve systems are produced, not, as in the former instance, in the air, but in the glass; and upon comparing these with the aerial spectrum, it is found that the colour of the system F, being deep red, agrees with that of A in the aerial spectrum G, with B, and in like manner the following systems, H, I, K, L, M, with those of the former, C, D, E, F, G; and by uniting the numerical values for the distances of the lines harmonizing in their colours, the main result is, that the length of the undulations in the glass is in proportion to that of those in the air, as 1 to 1.53, furnishing a direct confirmation of the truth of the undulatory theory. The correctness of these results was also stated to depend on the absolute accuracy of the distances of the lines, as an error of only $\frac{1}{300000}$ th of a Paris line was found to produce stripes of other colours, and if the distance of the lines in system M (that which produces the violet rays in the glass spectrum) is diminished by only $\frac{1}{50}$ th of that amount, the colour will entirely disappear.—*J. W.*

Dublin Natural History Society.

Friday, March 10, 1851. Dr. Croker, M.R.I.A., in the chair.

Mr. Andrews stated that he had received apologies from two members who were to have prepared papers on that evening, expressive of regret that they were obliged to defer their intentions to another night. However, he hoped that the evening would not be barren of proceedings, as his friend Mr. Callwell had kindly consented to give his views of the treatment and cultivation of one of the most beautiful and most rare of our native ferns—*Trichomanes*, or, as it is termed and known at Killarney, the hare's-foot fern.

Mr. Callwell observed that the statements he was about to make were upon the experiments and the successful results of his several modes of treatment of the cultivation of that beautiful fern. In the year 1842 Mr. Andrews had given him a plant having two fronds, one about six inches in length, the other partially developed. These he placed under a bell-shaped glass shade, which was about fifteen inches in diameter and eighteen inches in height. The fern was planted in pure maiden earth, or virgin mould, a good drainage being formed by placing inverted flower-pots in the receiver. Through this mould he interspersed portions of charcoal. The temperature and moisture were carefully regulated, although but little watering was given to the plant. Great care was taken to keep the growing fronds from contact with the glass, for so delicate and sensitive were the beautiful fronds when expanding, that should they rest against the glass they became blackened and unsightly. In the spring of 1845, so luxuriantly had the plant extended that he removed the mass to a larger case. At that time there were about twenty fronds, all fully developed, and presenting that beautiful green hue and delicacy of texture which are the remarkable characteristics of the plant. The new habitat was a case of a neat mahogany frame, glazed on all sides and having a deep tray of zinc. Its measurements were three feet nine inches long, two feet six inches broad, and three feet three inches high, having a depth of tray or receiver ten inches. Height in the case he considered of much importance for the proper encouragement of growth. The zinc tray was placed on a strong floor; the mass of plants were laid in soil similarly described, with the charcoal throughout, having previously put as before the inverted flower-pots, and the addition of cocoa-nut husks, so as in every way to facilitate perfect drainage. It was of great importance to the healthy growth of the

plants to prevent any lodgment of moisture in the mould, or any tendency to the mould souring from undue excess or retention of moisture. To avoid this he had placed around the case a rim of zinc, and by judiciously placing skeins of worsted the drainage was directed to a proper course, and the water easily carried off by means of a stop-cock, which could be turned when necessary. Other most important measures were to regulate light and temperature. The case was placed in a lobby where it received only a subdued light, with but partial rays of the sun through the medium of green glass, and where the temperature was generally even throughout the year, for the plants would not bear any degree of heat; thus moisture, an equable temperature, and a modulated light were the essentials for effective growth. It would appear where Mr. Andrews had made the discovery of such splendid plants in Kerry, that a shaded moist temperature was the delight of this fern. The fronds in Mr. Callwell's case were not so large or fine as the specimens found by Mr. Andrews, but his was a new station in Iveragh, and those he cultivated were from Killarney. He should have mentioned that in forming the compost for the plants, he had raised a kind of mound towards the centre of the case, that the plants might be better seen, and now the entire case was filled and covered with the fronds. In the winter of 1849 he suspended from the roof of the case a block of wood, and to this he attached a plant, which had now crept over the wood with its rhizomata, and was spreading its roots in all directions. Mr. Callwell said that he would feel happy in showing his case to any of the members, or giving them any further information of his system, and Mr. Andrews would now give them an idea of the great beauty and peculiarity of the fern, by submitting the specimens he had brought with him.

The Chairman said that he would be glad to hear any remarks upon the subject. He considered those ferns to be of extreme interest, being, as he believed, in the British Islands only now known to exist in the south-west of Ireland, although it was said to be originally found in Yorkshire. He was much pleased with their appearance in a case in which he had them growing.

Mr. Andrews then exhibited beautiful specimens of those ferns from Iveragh and Killarney, in Kerry; also specimens, both of *Trichomanes* and *Hymenophyllum*, from the Isle of France, the East and West Indies, Hong-Kong, and South America. He observed that the remarks of Mr. Callwell could not but be of interest to those who delighted in their gardens and in the cultivation of plants, and those described by Mr. Callwell would repay the care bestowed upon them.

Mr. Callwell's treatment had been most successful; indeed it might be said that no one had so extensively cultivated this beautiful plant. An equable temperature, moisture, and a kind of diurnal twilight were the features best suited to the health and vigorous luxuriance of the plants. They would bear extremes of cold, provided the temperature was even or not subject to transition. Mr. Callwell had, however, tried a most successful plan of growth in the addition of charcoal. The use of peat charcoal had been most advantageously applied to the culture of plants in several gardens in England, particularly in those fine gardens of Bicton, in Devonshire, where, with New Holland plants, the success of peat charcoal was astonishing. Charcoal, loam, heath-mould, with river sand and good drainage, will succeed with most plants. The first notice of this beautiful fern in Britain was at Belbank, in Yorkshire, a barren specimen only being found. It was quoted in Hudson's 'Flora Anglica' as *Trichomanes pyxidiferum* of Plumier. Dr. Mackay, however, finding plants at Killarney in fructification, decided its distinction from the plant of Plumier, and it was figured in 'English Botany' by Sir J. E. Smith as *Hymenophyllum alatum*, from its winged stem. Subsequently it was named *Trichomanes brevisetum*, which name it retained until the discovery, in 1842, in Iveragh, Kerry. The peculiar character of growth and fructification at once led to its identity with *Trichomanes radicans* of Swartz, and the comparison with specimens from the Mauritius, from the West Indies, and from South America, established its affinity with those tropical species, and, as Sir Wm. Hooker observed, spoke volumes in favour of the climate of the south-west of Ireland. Mr. Andrews said that the treatment adopted by Mr. Callwell, by regulating the temperature, would be applicable to the culture of the exotic species of these beautiful ferns. The West India Islands are remarkable for the variety and beauty of the family of the *Hymenophylla*, particularly those of volcanic origin. The Iveragh plants, in the alternate, numerous, pinnated, almost pellucid fronds, bear, as to growth, a near resemblance to the *Trichomanes radicans* and *T. brachypus* of Jamaica and St. Vincent's, which beautiful plants in those islands, at the highest elevations, spread like a velvet carpet over the moist and massive trunks of aged trees. The Rev. Lansdowne Guilding describes the *T. radicans* of St. Vincent's to have long creeping main stems or caudices. The true *T. pyxidiferum* of Jamaica grows abundantly in the island of St. Vincent's, at an elevation of 2,000 feet above the level of the sea, thus showing that this tribe in the tropics affects a much higher elevation, where the temperature, being lower, is more conducive to their

healthy existence. *T. pyxidiferum* is distinguished by the broad revolute mouths of the involucre, the involucre being broadly winged and sunk in the pinnules of the frond; the receptacles are of considerable length. The plant from Kerry is similar in form to the *Trichomanes alatum* of Jamaica, but from that it is separated by the more membranous structure of the frond of *T. alatum*, and in the forked cilia existing at the termination of the pinnæ. Many of the *Hymenophylla* are extremely beautiful, and several bear a striking resemblance to our native plants, *Wilsoni* and *Tunbridgense*. Thus, *H. axillare* has orbicular involucre, situated as in *H. Wilsoni*, and *H. polyanthus* another example, its reticulated ovate involucre dividing similar to *H. Wilsoni*. *H. dilatatum* and *semibivalve* of New Zealand, *crispatum* from Nepaul, and the West Indian *undulatum* are all beautiful examples. The fruit of *H. crispatum* bears, in the character of its orbicular involucre and the position of growth, much resemblance to *H. Tunbridgense*. This beautiful plant is found in the Peruvian Andes, near the limits of perpetual snow, embracing with its creeping rhizomata the trunks of trees. But the handsomest is *Hymenophyllum elasticum* from the Mauritius, which covers the moist and shaded trunks of trees. Its pinnules are elastic, and its shining appearance contrasts with beautiful effect with the black midribs.

Mr. Andrews, in showing the specimens of this beautiful fern, said that his friend Dr. Alexander, R.N., a most zealous botanist, had seen *H. elasticum* in great abundance in a mountain cave at Kow-Loon, the side opposite Hong-Kong. He had also met with that rare fern, *Anthropium Boryanum*, in shaded places on the banks of the Sarawak, Borneo, near Rajah Brook's residence. Mr. Callwell had spoken of the manner he had grown the *Trichomanes* suspended; the plants appeared to delight in that position of growth, and Mr. Andrews had successfully cultivated them in that manner, and the plants had produced fructification in perfection. In this manner, creeping over a moistened surface, none would appear more beautiful than *Trichomanes membranaceum*, or those beautiful plants *T. reptans*, *apodum*, and *parvulum*, which, like frondose *Jungermannia*, spread over the branches of trees. He would mention a very pretty *Jungermannia*, peculiar, as a parasite, to *T. radicans*, which he found on the Kerry plants—the *Jungermannia minutissima*. On receiving a specimen of *T. radicans* from the Mauritius, he found this *Jungermannia* on the frond identical with the Kerry parasite. *Jungermannia Hutchinsea* and *Protonema cryptarum* are also favorite companions of *Trichomanes*. Mr. Andrews would mention a singular character of the fern;

viz., that fronds which he had collected and planted in a case in 1842 were still green and healthy.

Mr. Callwell said he would bear evidence to the same effect, that fronds which he had originally obtained were now in healthy condition; and he would also state that the only fern that he found to grow with *Trichomanes* in the same case was *Asplenium marinum*.

Mr. Whitla conceived that a very important feature in the cultivation of such plants was a still atmosphere, and he did not place much reliance upon geological formation in the cultivation of any plant. He thought, however, that in the cultivation of *Asplenium marinum* saline ingredients were necessary to its growth; but with regard to soil or rock, he thought that plants properly treated, without reference to geological character of soil, would thrive equally well. He had collected in Clare, *Orobanche rubra* growing abundantly in limestone. This had been stated to be a plant peculiar to basalt, and only found in such districts. It was a parasite attached to *Thymus Serpyllum*, which was a plant of general distribution.

The Chairman then directed the ballot, and Dr. T. R. Mitchell and Francis Brady, Esq., were declared duly elected members. Others having been proposed for ballot on the next evening, the meeting was adjourned.

Tyneside Naturalists' Field-Club.

March 21, 1851. The President, Dennis Embleton, M.D., in the chair.

Ralph Carr, Esq., of Dunston Hill, read the continuation of his paper 'On Composite Names of Places of Anglo-Saxon Derivation.'

Mr. Storey read an abstract of his paper 'On the Flowering Plants and Ferns found within five miles of Newcastle-upon-Tyne.'

Mr. Albany Hancock presented a short paper, intituled a 'Notice of the Occurrence of *Diphyllidia lineata* on the Durham Coast.'

A collection of Algæ and corallines was sent for inspection by Miss Errington.

Dr. Embleton and Mr. D. Oliver, jun., exhibited numerous well-dried specimens of ferns and other plants.

On the following day the Anniversary meeting was held in one of the rooms of the Government School of Design, when the President, Dr. Embleton, delivered an able and highly interesting address; after

which, Mr. Carr read the concluding portion of his paper on the composite names of places.

The following gentlemen were elected Office-bearers for the ensuing year:—President: Robert Ingham, Esq., Westoe. Vice-Presidents: Dennis Embleton, M.D., Rev. J. F. Bigge, and Mr. William Kell. Treasurer: Mr. Thomas Burnet. Secretary: Mr. John Storey. Committee: Rev. G. Cooper Abbes, Mr. Albany Hancock, Mr. John Hancock, Mr. Joshua Alder, Mr. J. T. Bold, Mr. George Tate, F.G.S., Mr. John Thompson, Mr. R. Y. Green, Mr. D. Oliver, jun., Mr. Robert Currie, Mr. Edward Mather, and Mr. Thomas Jefferson.

The following gentlemen were elected members of the Club:—George Robinson, M.D., Capt. Moody, R. E., Mr. J. B. Falconar, jun., Mr. E. B. Richardson, Mr. G. A. Hutton, and Mr. F. J. Peck, Newcastle; Mr. James Forster, Gateshead; Mr. Stephens, North Shields; Rev. Cuthbert J. Carr, Witton Gilbert; and Rev. Joseph Depledge, Chester-le-Street.

The days and places of meeting were fixed as under:—

Bywell and Riding Mill,—Friday, May 30.

Durham and Finchale,—Friday, June 20.

Allenheads,—July.

Staward Peel,—Wednesday, August 20.

Roker and Whitburn,—Friday, September 12.

Corbridge and Stagshaw,—Friday, October 3.—*J. S.*

Orchis hircina in Kent. By GEORGE B. WOLLASTON, Esq.

I HAVE now in my possession a very fine flowering plant of *Orchis hircina*, brought to me on Good Friday of the present year by an intimate friend, from a locality which I showed him last year, and where we found five small plants of the same. The locality is in the neighbourhood of the old station mentioned in Sowerby's 'British Botany.'

G. B. WOLLASTON.

Eltham, April, 1851.

Notice of 'The British Flora: comprising the Phænogamous or Flowering Plants, and the Ferns. The Sixth Edition, with Additions and Corrections, and numerous Figures illustrative of the Umbelliferous Plants, the Composite Plants, the Grasses, and the Ferns. By SIR WILLIAM JACKSON HOOKER, K.H., LL.D., F.R.A. and L.S., Vice-President of the Linnean Society and Director of the Royal Botanic Gardens of Kew; and GEORGE A. WALKER-ARNOTT, LL.D., F.L.S. and R.S.E., and Regius Professor of Botany in the University of Glasgow. London: Longman and Co. 1850.'

IN his 'Observations on Natural Systems of Botany,' Dr. Drummond, in somewhat dolorous terms, comments upon the supposed decline of a popular taste for botany in this country. This decline he attributes to what he is pleased to consider the ill-advised efforts of Dr. Lindley and others, to place the study of that science upon a more sound and more philosophical footing than had previously obtained. Such lachrymose 'Observations' as those of the worthy Doctor, could only have emanated from one who is utterly ignorant of, or wholly inattentive to, the *spirit* of the principles inculcated by Linnæus himself. No one who has studied the botanical works of the great Swede with the attention they deserve, and with a mind free from prejudice, can have failed to perceive that the spirit which throughout animates his writings is essentially one of progress; and had their author lived to witness the full development of his earlier labours, he would have been the first to condemn a slavish adherence to the mere letter of a system, originally intended but to subserve a merely temporary purpose.

Dr. Drummond, moreover, lays great stress upon the circumstance that Sir J. E. Smith, Mr. Roscoe, and other botanists who were eminent in their day, attained eminence chiefly through their devotion to the Linnæan artificial system of classification. On the other hand, if we remember aright, he censures Dr. Lindley for having abandoned the use of that system, upon finding from experience that, *per se*, it leads to little beyond a knowledge of names. In this Dr. Drummond apparently forgets, or at all events he overlooks, the fact, that Dr. Lindley has done little more than follow the example of Sir J. E. Smith, Robert Brown, and other British botanists, who may fairly be ranked among the *facile principes* of the science. These eminent men, through steadily keeping in view the end and aim propounded by Linnæus, as the only object worthy of pursuit to every true lover

of the science, and acting up to the spirit of their master's principles, as opportunities for so doing were afforded by the increasing intelligence of the age, laid the foundation for the high position among the natural sciences, now held by botany in this country.

Sir J. E. Smith, for example, after he had widely extended the circle of cultivators of this pleasing pursuit, by the precise and elegant style of his 'Introduction,' wherein the Linnæan artificial system is lucidly explained, in his 'Grammar of Botany,' a subsequent work of equal merit and utility, proceeded to unfold the principles of that more precise mode of investigating the intimate structure of plants, upon which is founded a plan of classification, whereby the "strong connexions, nice dependencies" of the various members of the Vegetable Kingdom are sought to be exhibited by those who look beyond the shadow and endeavour to grasp the substance of the object of their pursuit.

The high position occupied by Robert Brown as a botanist is too well known to require any eulogy from us; we may, however, be allowed to express regret that he has favoured the world with so few examples of his transcendent abilities and superior attainments in a science he is so well fitted to elucidate and explain.

Of Dr. Lindley, we need say no more than that we believe him to have been the first public teacher of botany who boldly ventured to break through the trammels of custom, by adopting in his lectures at University College, that mode of study which has already done so much towards removing from our favourite pursuit the opprobrium of being merely a science of words without ideas,—a useless repertory of names without meaning. Dr. Lindley's 'Synopsis of the British Flora,' originally intended chiefly for the use of his own classes, together with his other works, prepared the way for that more general recognition of the superior value of the natural method over an artificial system, which Dr. Drummond so deeply deploras.

"*Nomina si nescis, perit et cognitio rerum*," is a Linnæan axiom the truth of which no one will dispute. But names alone are not—cannot be—the sole end and aim of philosophic research. The discovery of the name of an unknown plant is one object proposed by the natural as well as by the artificial method of investigation; and to this, as one important branch of the science, we have never objected: on the contrary, we have ever contended, that to acquire no further knowledge of botany than the ability to determine the names of the various plants met with in our daily walks, is to acquire as it were another sense. But the knowledge of intimate structure and of mutual relationship which attend the use of the natural method, amply

compensate for any temporary delay or disappointment, any additional trouble, in the acquisition even of the mere name of the plant under investigation; while the comparative facility with which this object is accomplished by the use of an artificial arrangement, will ever lead too many to stop short at the very point where their labours ought to commence, even in accordance with one of the advantages claimed by the exclusive advocates of such artificial schemes, namely, that the name being known, there is no difficulty in further ascertaining all that has been recorded in reference to the plant in question.

Now, if we understand Dr. Drummond aright, it is the decline in popularity of this mere name-knowledge that he so feelingly deplures. He would appear to be a rigid conservative in scientific matters; one of those who, unmindful that "old things are passed away," in consequence of the increased means and appliances now placed at the command of the student, would have all scientific research confined to the narrow limits which bounded inquiry at the period when the newly promulgated Linnæan artificial system charmed by its simplicity, as compared with the modes of investigation previously in use, and, from its ready applicability, seemed to render further improvement undesirable, if not impossible. But the onward progress of science is no more to be arrested by puling regrets than by arbitrary attempts at suppression. In the darkest ages of her history there have ever been far-seeing eyes capable of beholding the bright futurity lying beyond the enveloping gloom, as there have always been bold tongues which, amidst the oppression of scientific despotism, could with Galileo fearlessly affirm—"And yet it moves!"

But is there really any foundation for the apprehension that a popular taste for botany in this country is declining? We unhesitatingly answer—No! A taste for that mere name-knowledge which long passed for botany is without doubt rapidly on the decline, but it is only to give place to a desire for knowledge of a higher and more satisfactory, because of a more precise and a more comprehensive character. As one proof of the soundness of this position, we would adduce the demand for a new edition of the work whose title stands at the head of the present notice. It may however be objected to such evidence, that this new edition is called for only after an interval of eight years from the appearance of the previous one arranged upon the same plan, while within the preceding ten years, during which the Linnæan system was followed in the arrangement, four editions of the same work were published. We would beg to remind any one so objecting, that during the interval of eight years, two editions of

Babington's 'Manual,' a work also arranged according to the natural system, have appeared to contest the field with the modified 'British Flora;' a circumstance in itself we deem a proof of the correctness of our position. For, with the exception of Lindley's 'Synopsis' and Macreight's 'Manual,' both arranged upon the natural method, we are not aware of any standard work on the general flora of Great Britain having appeared to dispute the possession of the botanical arena with the 'British Flora,' and neither of these can be said to have attained any decided advantage on the score of popularity. We may also mention the two editions of Dr. Lindley's great work, 'The Vegetable Kingdom;' a second and enlarged edition of his valuable 'Introduction to Botany;' one if not two of the same author's 'Elements;' besides two distinct Manuals founded upon the excellent 'Cours Élémentaire' of Jussieu; as so many additional proofs that a popular taste for botany has in no wise diminished of late years: and moreover, in further proof of this may be cited the several botanical periodicals, besides the flourishing condition of the two metropolitan Botanical Societies and the Botanical Society of Edinburgh.

Dr. Drummond's lamentations, in short, serve but to confirm Sir W. Hooker's remark, that it has too long been the practice for those who have devoted an exclusive attention to either the artificial or the natural method, to decry that with which they are unacquainted, or at least the advantages of which they have not had the good fortune to experience: as well as the wisdom of the observation previously made by Mirbel, that "Ceux qui proscrivent l'usage des méthodes artificielles n'en ont point saisi le véritable esprit: ceux qui ne s'attachent qu'à ces classifications arbitraires, ignorent la beauté et la dignité de la science." Both classes are in the wrong; but those more especially err who, at the present day, would bar the progress of science by confining their researches to the narrow boundaries which necessarily circumscribed her infancy.

Gladly therefore do we extend the right hand of fellowship to our ancient friend, the 'British Flora,' on the occasion of this his fifth re-appearance. Not as a stranger do we give him welcome, but rather as an old friend with *another* new face; for it must be confessed, that our respected acquaintance, with the characteristic versatility of a Briton, has been somewhat given to change in the matter of dress and personal appearance. We trust, however, that our friend has at length quietly settled down into the douce, cannie body now before us, in whom a certain substantial weel-to-do air seems to inspire confidence, while at the same time it commands respect.

Nor are our favourable first impressions in any wise diminished on a closer acquaintance; they are on the contrary confirmed, and our confidence is increased, by the numerous and very manifest improvements on the preceding editions observable throughout the present. One of these consists in the adoption of a uniform nomenclature in the names of the orders, which, with but eight exceptions,* are now made to end in *aceæ*, in place of the heterogeneous assemblage of *ineæ*s, *ideæ*s, *ieæ*s, *eleæ*s, and so on, formerly followed in defiance of all the advantages of a uniformity in nomenclature, first pointed out, we believe, by Dr. Lindley, in the second edition of his 'Introduction to the Natural System of Botany,' published in 1836; wherein the author proposes to distinguish orders by the termination *aceæ*, sub-orders by *eæ*, alliances by *ales*, and certain combinations called groups by *osæ*; the names of all divisions of equal value being thus made to end in the same way.

Another very great improvement is the introduction of the Conspectus of Orders at the head of each sub-class, whereby the necessity of turning over half the volume before one can hit upon the order sought for is entirely obviated, to the saving of much valuable time, and the prevention of many sore trials of patience consequent upon disappointment. And equally useful is the Synopsis of Genera given at the head of each order. None but those who have had experience of the additional trouble arising from their omission, can duly appreciate the utility of such aids to research, artificial though they be.

Indeed, every page of this new edition of the 'British Flora' bears ample evidence of the care and attention bestowed upon it. The diagnoses and descriptions of the genera and species appear to have been carefully revised throughout; and the editors have obviously exerted themselves to render the volume a faithful chronicle of the present advanced state of botanical knowledge, so far, at least, as British plants are concerned. The 'British Flora,' in consequence, is no longer a mere *rifacciamento* of former editions, as was the case with its immediate predecessor, but, thanks to editorial vigilance, it must rather, in many important particulars, be looked upon as a new work, as we shall now proceed to show by a few examples.

In the fifth edition of the Flora, the number of species of *Ranunculus* is given at sixteen; the second edition of Babington's Manual contains nineteen; and the present edition of the Flora twenty. This increase is due to the attention bestowed upon the plants included in

* These exceptions are the orders *Compositæ*, *Coniferæ*, *Cruciferæ*, *Cupuliferæ*, *Gramineæ*, *Labiataæ*, *Leguminosæ*, and *Umbelliferæ*.

the first section of the genus, since the publication of the fifth edition of the Flora. These are characterized by their transversely wrinkled achenes, their white petals, and their naked nectary; and two species only—the *R. aquatilis* and *hederaceus* of Linnæus—formed the whole of the section in the former edition of the Flora. Mr. Babington raised the number to five, by the addition of *R. circinatus*, *Sibth.*, *R. fluitans*, *Lam.*, and *R. Lenormandi*, *Schultz*. In the Flora we have the *R. tripartitus* of DeCandolle introduced as a new species, thus increasing the number in this section to six; the editors however state that they keep *R. circinatus*, *aquatilis* and *tripartitus* distinct, out of deference to the opinion of Mr. Borrer, being themselves “not convinced that the differences hitherto observed are of more importance than to denote *perhaps* permanent varieties;” DeCandolle himself being doubtful as to the claims of *R. fluitans* to rank as a species. Indeed, all the *Ranunculi* that grow in water are necessarily so much affected by the varying conditions of that medium, that we must confess our suspicions that the whole of the four so-called species are merely transitory forms of one; and they certainly differ not more widely in character than that variety of *R. aquatilis*, called by DeCandolle *R. pantothrix*, which flourishes in running water, does from the more common form of the same plant that covers the entire surface of still pools with its reniform floating leaves and conspicuous white blossoms. The name of *Lenormandi*, conferred by Schultz upon that form of *Ranunculus* distinguished by Mr. Babington as *R. hederaceus*, *β. grandiflorus*, is in the Flora superseded, at Mr. Borrer’s suggestion, by that of *R. cœnosus*, *Gussone*: and with regard to these two plants, *R. hederaceus* and *R. cœnosus*, the editors seem inclined to go even farther, and to adopt the opinion of M. Seringe, who has closely studied the whole of the plants included in this section, and long since recorded his conviction that all are mere varieties; and we are by no means sure that he is not right.

The controversy respecting certain forms of violet which was carried on in our pages a short time since, has led to the adoption, in the new edition of the ‘British Flora,’ of Mr. Watson’s conclusions respecting *Viola flavicornis* and the allied forms. Thus, the *V. sylvatica* of Fries (*V. flavicornis*, *Forst. in E. B. S. t. 2736*) now stands as the *V. canina* of Linnæus; and *V. flavicornis* of Smith, the *V. canina* of Babington, but not of either Gerard or Linnæus, is given as the *V. pumila* of Villars. Under this species the editors observe that “the name *canina* having been given by Gerard to the last species, apparently as a translation of the common English name, and being

merely adopted by Linnæus from him, in preference to *sylvestris* given to it by Parkinson, cannot be applied to the present species, which was confounded with it by Linnæus, and was first noticed by Dillenius." The following remarks on *V. pumila*, from the pen of Mr. W. H. Purchas, are interesting and valuable as apparently affording a good mark of distinction between that species and *V. canina*:—

"A series of buds are, towards the autumn, formed in the axils of the lowermost leaves of each flowering branch; of these it sometimes happens that one or two only develope into new flower-bearing shoots in the succeeding spring, the remainder being then found below or above the base of the new flowering shoot, according to the position of the bud from which it has been produced. Later in the season the rest of the buds elongate into branches, producing fruit, but without expanding or even forming a corolla: this last is also at the same time exhibited by the older branches. The old flowering stem dies in the winter down to the point at which the buds just mentioned are formed, and thus it is always found *above* the point from which the new one springs; while in *V. canina* the reverse is the case, the dead flowering stems always appearing *below* the new ones."—P. 48.

When may we hope to see the much vexed question of the British fruticose brambles placed upon a sound footing? A tyro may well be excused for making this inquiry, when he finds those whom he regards as masters in botany so much at variance regarding the specific distinctness of these troublesome plants. We look back to the fifth edition of the 'British Flora,' and there find *ten* forms characterized as species; we next turn to the second edition of Babington's Manual, and to our consternation perceive no fewer than *thirty-two* so characterized; again, on referring to the sixth edition of the Flora, lo and behold! these are reduced to the moderate number of *six*!—with a foot-note indicative of a wish to reduce them still further to "*four* types," while the opinion is plainly expressed that they constitute but *one* variable species!! In the form of a "Supplement," however, is given Dr. Bell Salter's Synopsis of the British Rubi, and there the fruticose brambles are again raised to the number of *twenty-one*!!! We think it evident, notwithstanding the insertion of this clever Synopsis, that the editors are not inclined to retract the opinion recorded at p. 120 of the Flora, in the following words:—"We are almost quite convinced—*practically*, not only because the characters taken from the young shoots, and disappearing when they are older and begin to blossom, are not permanent, but because none of the reputed species of the shrubby brambles are either anatomically or physiologically

distinct, all passing into each other without any fixed assignable limit—and *theoretically*, from a consideration of what is requisite to constitute a difference between the other European species of *Rubus*, that all of the present section are mere varieties approaching on the one side to *R. Idæus*, on the other to *R. saxatilis*, with both of which many fertile and permanent hybrids may have been formed, and are still forming." If this be the case, and we are not disposed to gainsay it, we see small chance of finding our way out of the already impermeable thicket, with all the assistance to be derived from the labours of "Weihe and Nees in Germany, and of Babington, Leighton, Lees, and, above all, Dr. Thomas Bell Salter, in this country," whose views the editors regret they are prevented by limited space from giving at length.

The genus *Hieracium* is another bone of contention among botanists. In the fifth edition of the 'British Flora' *thirteen* species were given; in the second of the Manual we have *twenty-one*; and in the sixth of the Flora *eighteen*: not quite so great a discrepancy as in the brambles, but still sufficiently puzzling. The latest work on the genus, Fries's 'Symbolæ ad Historiam Hieraceorum,' is referred to, though the arrangement of that author is not adopted, since the editors observe they "cannot retain entire either his principal groups or subdivisions, not being able to satisfy [themselves] of the validity of the characters proposed." Nor indeed can we wonder at this, for we see but little use in giving characters at all, if Fries himself is to be credited, since he observes that "characteres nullo modo sunt specierum criteria, tantum ad species discernendas adminicula." Nor is he far wrong in this remark, if applied to many of the so-called characters given in other modern botanical works besides his own; and some idea may be formed of the value of those given by himself, when we mention that out of the *thirty-two* species enumerated by Fries as natives of Britain (thus beating Babington by *eleven*), the editors of the Flora confess their inability to identify but few, in the absence of authentic specimens.

We give an enumeration of the species of *Hieracium* as they stand in the Flora, for the purpose of comparison with the analysis of Fries's *Symbolæ* in a previous number of the 'Phytologist.'

1. *Plants producing scions. Ligules glabrous at the apex. Achenes minute, striated. Hairs of the pappus equal, very slender.*
1. *H. Pilosella, L.*: 2. **aurantiacum, L.*

2. *Plants producing (in autumn) a tuft of spreading leaves about the root. Achenes large. Hairs of the pappus unequal.*

3. *H. *villosum, L. (not E. B. t. 2379): 4. alpinum, L.: 5. nigrescens, Willd. = pulmonarium, Sm. E. B. t. 2307: 4. pallidum, Biv. = Halleri, Hook. Fl. Lond. t. 215; Lawsoni, Bab.; villosum, E. B. t. 2379; Anglicum, Fr.; Sternbergii, Fræcl.: 7. murorum, L.: 8. sylvaticum, Sm. = vulgatum, Fr.; var. β . = maculatum, Sm. E. B. t. 2121: 9. Gothicum, Fr. Symb. p. 121: 10. cerinthoides, L. = Lawsoni, Sm. (not Vill.) E. B. t. 2083; Lapeyrousii, Bab. E. B. S. t. 2915; Iricum, Fr. l. c. p. 60: 11. *amplexicaule, L.: 12. Dovrense, Fr. l. c.*

3. *Plants producing (before winter) leaf-buds at the base, which next year become leafy stems without radical leaves. Achenes of moderate size, truncated upwards. Hairs of the pappus unequal.*

13. *H. prenanthoides, Vill. = denticulatum, Sm. E. B. t. 2122: 14. strictum, Fr. l. c. p. 164 = denticulatum, Bab.? 15. boreale, Fr. = Sabaudum, E. B. t. 349; inuloides, Bab.? 16. rigidum, Hartm. (Fr. l. c. p. 173): 17. tridentatum, Fr. l. c. p. 171: 18. umbellatum, L.*

We have space for but one more reference, and that is to the much-contested question of a group of ferns which, by some authors, are all included under the genus *Aspidium*, while by others they are divided into two genera—*Polystichum* and *Nephrodium* or *Lastrea*. In the present edition of the ‘British Flora,’ the genus *Aspidium* is retained intact, as in the previous editions, being merely divided, as in them, into two sections, characterized by the form of the involucre. Under *Aspidium spinulosum* of Willdenow, four varieties are given, viz:—

A. spinulosum, Willd. = A. dilatatum, Hook. Fl. Scot. ii. 154: —var. α . = spinulosum, E. B. t. 1460: —var. β . = dilatatum, Willd. E. B. t. 1461; dumetorum, Sm.; Polypodium dilatatum, Hoffm.; Lastrea, Presl: —var. γ . = dilatatum var. recurvum, Bree; Lastrea recurva, Newm.; L. Fœnisecii, Bab.; Nephrodium Fœnisæcii [sic], Lowe? (in part): —var. δ . is an unnamed supposed monstrosity.

This fern is said by the editors to be “an extremely sportive plant, it must be confessed; but an attentive observer of Nature will not find it difficult to trace the different states passing into each other, so that we cannot in our herbarium bring all our numerous specimens under the heads even of our own forms.” The following editorial foot-note contains further remarks on some of these protean forms:—

“On the *quæstio vexata* of the differences, specific or otherwise,

between *A. spinulosum* and what are here considered varieties, we have little to add, although we have not failed to reconsider the subject fully. No one has studied the ferns with a candid and unbiassed mind, but must be satisfied that uniformity of opinion as regards the due limitation of their species is not to be looked for among botanists. In the present instance, we believe the conclusions to be drawn from a careful investigation of *A. spinulosum* and its allies would be as various as the individuals who examine them. One state of the plant, however, we are here desirous to notice, from the great discussion it has occasioned in some of the periodical journals, namely, *Aspidium dilatatum*, var. *recurvum*, of Bree in 'Loud. Mag. Nat. Hist.,' vol. iv. p. 163, cum. ic.: *Lastrea recurva* of Mr. Newman, in 'British Ferns,' 1844, p. 226. We find no specific character in the latter work; but this deficiency is compensated by Mr. Babington, who ('Man. of Brit. Botany,' ed. 2, p. 411), under the name *Lastrea Fœniseeii*, thus distinguishes it: '*Fronde triangular bipinnate*, pinnules pinnate or pinnatifid, 'segments serrate spinose-mucronate, indusium jagged at the edge, stipes clothed with long narrow laciniated concolorous scales;' and he further adds in the description—'*frond elongate-triangular concave above, the lower pinnæ much the largest. A smaller plant than the two preceding.—Damp places.*'—Sufficiently corresponding with this, we have now before us the Cornish specimens from Mr. Bree and Irish ones from Mr. Wilson, besides a living plant cultivated in the Royal Gardens of Kew, under the name of '*Lastrea recurva*' *Newm.*: these, too, tolerably accord with the figure above quoted of Loudon, especially in the scarcely spinulose teeth; but they are more compact in the pinnules, and the rachis and frond beneath have rather copious very minute spherical glands. We cannot say much in favour of the figure of *Lastrea recurva* (under the name of 'Bree's Fern') of Mr. Newman, p. 225, which has a very lax habit, with distant pinnules, and moreover (being stated to be 'one-fourth of the nat. size,' and, though folded, yet occupying the entire 8vo. page) must be a large plant,—nearly 4 feet high including the stipes. We have also a plant of Dr. Lippold's '*Plant. Exsicc. of Madeira*,' marked '*Nephrodium Fœniseeii* α . Lowe Prodr.;' and probably Mr. Babington adopted the name from Dr. Lippold's specimens. These we are disposed to include under our var. γ . of *spinulosum*. But we have now to consider the *Nephrodium Fœniseeii* of Mr. Lowe himself: '*N. fronde triangulari vel ovata, 3—4 pinnatifida, utrinque glabra: laciniis (tertii 4-tique ordinis) oblongis, obtusis; ultimis incisus mucronato-serratis; omnium inferioribus exterioribus internis oppo-*

sitis majoribus : soris numerosis distinctis : indusiis primo semiovatis v. reniformibus, demum orbiculatis, emarginatis : stipite breviusculo, basi sparsim sub-paleaceo, fusco, superne rachique pallidis' Lowe Prim. Faun. et Fl. Mad. &c. 1831, p. 7.—'Odor gratissimus, fœnum novum redolens, constans.' Two varieties are constituted, viz. α . alatum, and β . productum : but the latter 'status potius prioris (α .), e loco obscuriore, defectu luminis, &c. quam varietas videtur.' And he adds—'Species Aspidio dilatato et spinuloso Auct. certe proxima ; et cum illis forsan, in unam speciem (ut ab amiciss. J. Hookero) consociatis olim conjungenda. Sed distingui posse, credo, figura frondis abbreviata, deltoidea ; stipite brevior, minus (sc. basi tantum) paleaceo ; pinnulis angustioribus ; odore.'—We do not find that we possess specimens thus named direct from Mr. Lowe : but, besides Dr. Lippold's specimens above-mentioned, we have both Mr. Lowe's varieties, α . and β ., from Madeira, so marked by our valued friend Dr. Lemann ; and there cannot be better authority for Mr. Lowe's plant. These unfortunately tell another tale ; for the α . is a very narrow-pinnuled form of *A. spinulosum*, having a long stipes with no scales, while the β . is a very common small form of *A. spinulosum*, and there is nothing in Mr. Lowe's characters at variance with these specimens. Whether Mr. Lowe had also Dr. Lippold's plant in view, it is impossible for us to say, but we think it is clearly that of Mr. Bree : that plant (Lippold's) retains its hay-like fragrance in the herbarium.

"We find it needful to make one remark more on a plant of this group, described (but without any specific character) under the name of *Lastrea uliginosa*, by Mr. Newman, in 'The Phytologist' for Oct. 1849, p. 678. It has been stated to have been 'shown to six eminent botanists, who have paid especial attention to ferns.' Their opinions stand recorded thus : 1. 'A form of *Filix-mas*.' 2. '*Lastrea rigida*.' 3. '*Lastrea cristata*.' 4. '*Lastrea spinosa Newm.* a strong variety.' 5. '*Lastrea dilatata*, a rigid variety.' 6. 'No way different from *Lastrea spinosa Newm.* I mean it would hardly pass for a var.'—The plant under the name of *L. uliginosa*, in cultivation in the Royal Gardens, corresponds with our *A. spinulosum*, α ."—P. 570.

From these and other examples which have been adduced, it will be evident that the editors are but little addicted to the modern sin of *hair-splitting*, which has certainly been carried rather too far. Whether they may not occasionally be fairly chargeable with a too close adherence to the opposite course of *lumping*, we must for the present leave our readers to judge, seeing that we have already exceeded our legitimate limits. For ourselves, we may venture the

remark, that we entirely concur in the opinion expressed in the following quotation, namely, that there is less violence done to the laws of Nature by “combining too much, than by subdivision, unless where there is an anatomical or physiological distinction.” Many a so-called *species* has in modern days been founded upon some trifling “distinction without a difference,” and apparently for no other earthly reason than a morbid wish on the part of its founder to see his name tacked on to the fag-end of some barbarous cognomen, which, perhaps, so far as classical accuracy is concerned, is “neither fish, nor flesh, nor good red herring.”

The editors, in giving their reasons for adopting the combination plan in preference to the homœopathic process of infinitesimal division, observe that—

“So many species have been, of late years, introduced from the Continent with seed-corn, or have escaped from our gardens, and so many of our former well-known species have been split into two or more, that it has been deemed proper to extend, in several instances, the characters of both the genera and species, introducing frequently a notice of the more minute parts which a practised botanist requires to examine, but which a student may omit, if his immediate object be to attain a knowledge of the name, until he has advanced in the study. Rarely, however, have the genera or species been made to depend on such minute characters, and therefore few alterations have been proposed on the limits of either one or other from what will be found in former editions: when such alteration has taken place in the former, it is solely from a desire of simplifying the generic characters.

“What is a genus, or what is a species, is a point upon which scarcely two botanists are agreed at the present day. With regard to the former, however much it may be necessary to subdivide in a system comprehending the known plants of the whole world, so as to retain only a limited number of species in each Genus, the same does not apply to a local Flora; and it is there preferable to constitute sections or subgenera, particularly when the limiting characters are inconstant, difficult, or obscure. A *species* cannot be so treated: it is formed, by our Maker, as essentially distinct from all other species, as man is from the brute creation; it can neither for convenience be united with others, nor be split into several; but the difficulty is to ascertain what is such a primitive or natural species; and it is here so great a difference of opinion exists. Some pronounce a species to be distinct if it presents a different habit or appearance to the eye, particularly if this be constant, although often indefinable: others

consider it a species, although exhibiting no difference of aspect, provided it can be defined, even although the differences are so minute that they can be detected only by the microscope; while a third party are of opinion that the validity of a species may be tested by cultivation. The Authors are not inclined to believe that any one of these tests is sufficient. Of all the works of Creation, we have a specific account only of Man; but as the others appear to be formed on the same plan, there is a strong presumption in favour of those arguments which assimilate the species of plants to what we know of the human race. With regard to mankind, it is universally acknowledged that there now exists so great diversity between an inhabitant of the torrid and an inhabitant of the frigid zone, and even of any one part of the globe and of another, that it can only be accounted for on the principle that each succeeding generation has a tendency to recede more and more, in general appearance, from the original type; and if we apply this to the Vegetable Kingdom, we must at once allow that, although cultivation may sometimes in a single year or two satisfactorily show that two supposed species are the *same*, a thousand years' cultivation cannot prove them *distinct*. The more we cultivate a plant, or the more it is limited in its wild state to a particular climate or place of growth, the more permanency is given to the peculiarities of what was originally derived from the same root, or even seed-vessel, of another apparently widely different form. Hence a rare mountainous plant may frequently be a mere alpine permanent state of some common lowland species, or a Swedish species the more northern race or state of a southern one; and it is from this cause that we see in our gardens so many called species (as in the genus *Achillea*), which cannot now be referred satisfactorily to any of the wild ones, although primarily derived from them. Knowing, then, this tendency of Nature to give permanency to a variety of forms obtained from one primitive species, there appears to be less violence done to her laws by combining too much, than by subdivision, unless where there is an anatomical or physiological distinction. Linnæus took nearly all his specific characters from conspicuous parts, especially from the stem and foliage, and they were therefore natural; but at the present day we are prone to select minute ones: of these some are of trifling value, while others, sufficient to constitute subgenera, are connected with the habit of the plant, and should therefore not be neglected. Indeed the time may ere long arrive, when what are now called genera or subgenera will alone be considered species, and another Linnæus be requisite to reduce the chaos into order. In the meanwhile, we have

endeavoured to steer a middle course: the species admitted in former editions are seldom reduced, unless where it was found that the characters were insufficient or variable; and as rarely has sanction been given to those which have been split off from other species, by the too-refined ingenuity of the German, Swiss, and modern Swedish botanists. If in one or two cases this neomania has been yielded to, it has been more on account of the remonstrances of the Authors' friends who had opportunities of examining the living plant, than from any conviction of either the necessity or utility of so doing."—*Introduction*, p. ix.

We cannot, of course, close our lengthened notice without being allowed to indulge a little in the critical privilege of grumbling. We are old-fashioned enough to wish to see the wholesome principle of *suum cuique tribuito* in all literary and scientific matters carried out to its fullest extent. We are not satisfied with merely knowing *what* a man has written upon any subject; we wish also to know *where* his observations are to be met with. For example, in the case of the violets—we are glad to see free use made of the valuable remarks by Mr. Watson and Mr. Purchas; but we should have been much better satisfied had the *locus in quo* been appended to such quotations—whether private communications, our own pages, or those of the 'Botanical Gazette' have been laid under contribution. And so of other cases. This may seem a small matter, but we contend that common courtesy, to say the least of it, demands such acknowledgment, especially when it is conceded in other instances.

Again—why is the stereotyped question "Root parasitic?" perpetuated in the case of *Monotropa*—or a doubt as to the parasitical nature of the root of *Lathræa* repeated, when in the former instance the non-parasitic nature of the root has been most satisfactorily demonstrated, while *Lathræa* has been quite as clearly shown to be a parasite? Mr. Babington in his *Manual* has candidly referred to the admirable paper by Mr. Rylands (*Phytol.* i. 341), wherein that gentleman, by a course of patient microscopic investigation, has shown the true nature of the roots of *Monotropa*; and Mr. Bowman's excellent memoir on *Lathræa* in the 'Linnean Transactions,' has long been known as a perfect model of persevering and conclusive research. To the editors these two papers must be familiar; and we should have been much better pleased had they given their reasons for rejecting the evidence afforded, instead of coolly dismissing the subject, without even a passing observation conveying either praise or censure.

We are also somewhat surprised at seeing a repetition of the doubt as to the occurrence of *Cucubalus baccifer* in the Isle of Dogs, when the circumstances attending its detection in that locality in the year 1837 are well known to almost every London botanist, not a few of whom have actually beheld it flourishing there. Without preferring any claim on the score of its being indigenous, we may record the late Professor Don's opinion, that the *Cucubalus* occurs in this, its only known British locality, under circumstances precisely similar to those which accompany its growth on the Continent.

As the "starred plants" have already formed the subject of some remarks in our pages from the pens of Mr. Lees and the Rev. Mr. Bree (*Phytol.* iv. 56 and 129), we need only refer to those papers, this being another subject upon which "different men" will ever entertain "different opinions."

We have omitted to mention that the editors have judiciously retained the "Synoptical Table of the Classes, Orders, and Genera of British Plants, arranged according to the Linnæan Method," which will serve as a useful Index to those who are still wedded to that plan of classification; with regard to the arrangement followed in the body of the work, we must confess that we should have been better satisfied by the adoption of Dr. Lindley's division of the exogens into diclinous, hypogynous, perigynous and epigynous sub-classes, in place of the *Thalamifloræ*, *Calycifloræ*, *Corollifloræ* and *Monochlamydeæ* retained in the Flora. In the natural system, the distinctions of classes are founded upon modifications of the organs of vegetation—such organs being essential to the life of the plant. In like manner, organs of equal importance in the performance of some other function should be selected whereon to found sub-classes; and none are so useful for the purpose as the organs of reproduction, on the agency of which depends the perpetuation of the species. All the functions of reproduction are exclusively performed by the stamens and pistils, the floral envelopes evidently bearing a very subordinate part in that office, from the fact of their very frequently being absent, without in the least affecting the fertility of the seeds, even in those plants which habitually produce them. In fact, no combination of calyx or corolla can be properly considered a flower, in the absence of stamens and pistils; while all the functions required for the perpetuation of the species can be and are performed by stamens and pistils even when the calyx and corolla are wholly absent. We may consequently expect to find fewer exceptions to the characters of groups founded upon the essential organs of reproduction, than in those wherein the floral

envelopes form the basis of classification, whether we make use of the apetalous, monopetalous and polypetalous sub-classes of Jussieu, or the Thalamifloræ, Calycifloræ, Corollifloræ and Monochlamydeæ of DeCandolle; and this is the fact, as will be evident on a consideration of even the plants comprised in the limited flora of Britain.

In conclusion, with all its failings—*faults* we will not call them—we have no hesitation in recommending the sixth edition of the ‘British Flora’ to the notice of botanists, as a valuable aid to the knowledge of our native plants. There has been an evident desire on the part of its editors to render it worthy the increased intelligence of the age; and in consideration of this we are but little disposed to criticise too severely any occasional short-coming.

Notice of the ‘Annals and Magazine of Natural History,’ No. 41, May, 1851.

This number contains but one botanical article, a full notice of which already appears in this journal, in the report of a meeting of the Botanical Society of Edinburgh, and the entire paper will again appear in the ‘Transactions’ of the same Society: it is intituled—

‘On a Supposed New Species of *Rubus*. By Fenton J. A. Hort, B.A.’

Notice of ‘The Naturalist,’ No. 3, May, 1851.

The only botanical note is restricted to three lines, and records the occurrence of “a specimen quite white” of *Linaria pilosa*. Whether the writer means a *specimen* or a *corolla* does not appear.

Notice of the ‘Botanical Gazette,’ No. 29, May, 1851.

The original communication is intituled—

‘Dr. N. J. Andersson’s Notes on the Rev. J. E. Leefe’s ‘*Salictum Britannicum*.’ Communicated by Hewett C. Watson, Esq.’

The import of this paper is faithfully summed up by Mr. Watson in these words:—“It will be observed that the general bearing of Dr. Andersson’s names and notes, is that of reducing the numerous forms

or varieties, distinguished by specific names in England, to a few typical species; and that he suggests also the likelihood of two or three additional species for our Flora."

Under the head 'Literature' the following works are noticed:—

'Researches on the Sleep of Plants. By M. Hoffmann, Prof. of Botany in Giessen. Heinemann, Giessen, 1851. 8vo, pp. 29.'

'Pocket Flora of Jena. By C. Bogenhard; with an Introduction by Prof. Schleiden. Leipsic, Engelmann, 1850. 12mo, 483 pages.'

The following paragraphs, from the brief notice of the first little *brochure*, are interesting:—

"The author runs through the different causes to which the phenomena known under the name of the sleep of plants can be attributed, in particular, conditions of moisture, electricity, light, expansion of gases within the substance of plants, heat, &c.; and through a series of interesting experiments, here described, he arrives at the conclusion that heat is the cause both of the awakening and the sleeping of plants, and that light only enters into those effects insofar as it contains heating rays. Plants, especially their leaves and flowers, unfold after the receipt of a certain sum of degrees of temperature, and are thus far, leaving out of view the chemical influence of light, indirectly dependent upon the sun, which is the sole source of the heat."

"Permanent heat causes a condition of contraction; a very great depression of temperature passing over during the perfect expansion acts in like manner, yet with essential differences, so that the plant is not exhausted by it, but on the return of warmth exhibits a new and perfect expansion. The condition occurs in extreme frequency in wild vegetation, and at every considerable sudden change of weather. A sudden but transient increase of temperature acts in the same way. With regard to the internal conditions producing these movements, the author attempted to find an explanation by placing thin slices of the pulvinus of the leaves of *Mimosa* and *Oxalis* in water, between plates of glass, and examining the relative positions of the elementary organs under the microscope, next quickly heating the fluid between the glass plates over a spirit-lamp, and then comparing anew the relative position of the parts under the microscope. He believes that he observed a contraction, by heat, of the exposed and somewhat unrolled spirals, which might well cause an alteration in the length of the parts."

The 'Pocket Flora of Jena' is spoken of with commendation.

A list of the contents of the following journals is given:—'Annals of Natural History,' Hooker's 'Journal of Botany,' 'The Phytologist,' Schlechtendal's 'Linnæa.'

‘Proceedings of Societies:’—Botanical Society of Edinburgh and Tyneside Naturalists’ Field-Club.

Under the head ‘Miscellanea’ are given Records of Localities, by Mr. John Ball; an Extract from the ‘Linnæa’ touching M. Milde’s observations on the germination of *Equiseta*; and another from the Bonn Transactions on certain malformations occurring in a cultivated specimen of *Primula sinensis*. The following paragraphs are interesting:—

Germination of Spores of Equiseta.—M. Milde “found that the most successful method of sowing them was to scatter them on the surface of water, taking care that they were not submerged; when they have sprouted they sink to the bottom, where earth must be placed to receive them. They must be sown while fresh from the capsules. The growth of the proembryo takes place very slowly, for spores sown in the middle of March only produced a mass of about six or seven cells in a fortnight, and the full size was not attained in less than two months; about the middle of May the antheridia, resembling those of the ferns, as described by M. Thuret in the ‘Annales des Sciences,’ were observed. At the end of four months the proembryo had not increased or altered, and the so-called ‘ovule’ of Suminski was sought in vain; but after the middle of July ten of the proembryos underwent a change; one of the sides of the proembryo acquired an inflated, thick, oblong form, attenuated at the apex, sometimes two-lobed; this organ equalled the whole proembryo in magnitude; nothing remarkable appeared in its internal structure, but the bud of the stem of the *Equisetum* seemed to be about to be formed in it. If this be the case, which was not decided at the period when the author’s notes were published, these organs would seem to be the ‘ovules.’”

Monstrosities of Primula sinensis.—These “consist chiefly of reversions of the parts of the flower more or less into the condition of leaves, but in the place of the carpels were found minute, imperfectly formed buds, with two or three leaves, and the place of the free central placenta was occupied sometimes by a circle of leaves, and sometimes by a collection of leaf-like organs bearing imperfect ovules on their edges.”

Notice of Hooker’s ‘Journal of Botany and Kew Garden Miscellany,’
No. 29, May, 1851.

The papers in this number are intituled:—

‘On the Character of the South Australian Flora in general; by

Dr. H. Behr; translated from the German in Schlechtendal's 'Lin-næa,' Bd. xx. Heft 5, by Richard Kippist, Libr. L. S.'

'Contributions to the Botany of Western India; by N. A. Dalzell, Esq., M.A.'

'Extracts from Letters of Richard Spruce Esq., written during a Botanical Mission on the Amazon.'

'Characters of some Gnaphalioid Compositæ of the Division Angiantheæ; by Asa Gray.'

'Botanical Information :—Advertisement of the 'Sale of a great Herbarium and extensive Collection of Drugs.'

'The Rhododendrons of the Sikkim-Himalaya; by Dr. J. D. Hooker. Edited by Sir W. J. Hooker. Parts I. & II.'

'Physiognomy of Tropical Vegetation; drawn and lithographed by M. de Berg.'

The translated paper on the South-Australian flora is highly interesting, although perhaps not absolutely novel; and I am truly glad to see so large a portion of this and other scientific works devoted to the reproducing, in English costume, the labours of our continental friends; I only regret that want of space prevents my making extracts.

Mr. Dalzell's paper contains characters of eleven new species. In the order Urticeæ one, *Pouzolzia integrifolia*; in Leguminosæ one, *Smithia hirsuta*; and in Commelyneæ nine, *Aneilema ochraceum*, *A. versicolor*, *A. pauciflorum*, *A. elatum*, *A. canaliculatum*, *A. dimorphum*, *A. semiteres*, *A. compressum*, and *Cyanotis hispida*.

From Mr. Spruce's paper I select the following passages:—

"On a separate sheet I have added a few notes respecting the articles I am sending for your museum, especially as to the use of the Guaranà. I would gladly have visited the Guaranà country, which is six days journey or more from here, but it would seem to be not very promising to a botanist, and the Guaranà plant is already perfectly well known. Respecting the bow I send you, I may add that the manufacture of such a one occupies an Indian *three months*; not exactly of continuous labour; but it must be borne in mind that it is made of the intensely hard heart-wood of the *Pao d'Arco*, and that his only tool is a shell. The wood which he intends to fashion into a bow is first smeared with oil, to soften it; he then scrapes it down with his shell as far as the oil has penetrated, when he anoints it anew, and betakes himself to the chase. Returned from hunting, he again falls to work to scrape his bow; and so on, until it is completed; and no joiner can make one so symmetrical, so nicely poised, as these which are made by the Memdrucuú and Maubé Indians.

The price of a good bow in Santarem is five or six patacas. I send an arrow, such as is used at Santarem for killing fish, such as Pirarucú, Tucunaré, &c.; the one-barbed head is called in *lingoa geral*, 'taçu-umba.'"

"After making several attempts to procure the flowers and fruit of the Itaüba I have at length succeeded. The nearest place in which I could obtain information of its growing was in the forest beyond Matricá, an Indian village about four miles down the Amazon; and in a visit I paid to them by water in March last, I found the flower-buds of the Itaüba just appearing. My illness prevented me from visiting the same place again until a long time afterwards, and in an attempt which Mr. King made to reach it alone, over land, he did not succeed, on account of the water in the low grounds. In another excursion, the trees we met with were all sterile. At length, in the early part of the present month, we were fortunate in falling in with a tree laden with fruit. The only way to obtain the fruit was to cut down the tree; but our *trésados*, which generally suffice for this purpose, made no impression on the hard wood of the Itaüba. In this emergency, Mr. King made his way to an Indian cottage which we had passed a few minutes before, and soon returned with a heavy American felling-axe. With this he succeeded in severing the trunk, but not until he had well blistered his hands. The drupes resemble in size and colour our small black grapes, only they are more elongated, and they hang in small panicles. The Brazilians compare them, and justly, to the small variety of olive which is imported in great quantities from Portugal. They have a slight bloom on them, and the pellicle is studded with pallid, glandular dots. The pulp is about the eighth of an inch in thickness; it is good eating, though with a strong resinous flavour, much resembling that of an edible myrtle frequent on the campos, and a wine is made from it in the same way as that of the Assaí palm. The testa is horny and very thin; albumen none; cotyledons amygdaloid, rose-coloured on the inner face; embryo pendulous from a little below the apex of the seed. The 6-cleft calyx is persistent, but not enlarged in fruit as in most of the Lauraceæ I have seen on the Amazon. I had long suspected the dioicity of the Itaüba; I have now confirmed it; and I find that I gathered male flowers on the 30th of April, though at the time I did not recognize the tree, which was small and young, and grew in a part of the forest quite near to Santarem, which had been cut down some dozen years ago. On revisiting the place within these few days, I found two or three female trees, of the same size, growing near, and

laden with unripe fruit. The male inflorescence is of minute yellowish green flowers, arranged in small umbels on a raceme. Perianth 6-cleft, in two series. Stamens 3, fleshy, with 2 anther-cells (rarely 3) imbedded in their substance, and opening *outwardly* by an orbicular operculum. These characters seem to indicate a genus hitherto undescribed, and certainly prove the Itaüba to be distinct from the greenheart of Demarara (*Nectandra Rodiei*), with which some of the English settlers here have supposed it identical. As I have before informed you, the Itaüba is the most valuable timber for shipbuilding which the Amazon affords. Its range seems to be from the mouth of the Tapajoz to that of the Rio Negro, and it is most abundant on the Rio Trombétas. It prefers gravelly or stony rising ground, and is never found in marshes."

The gnaphalioid Compositæ characterized in Dr. Asa Gray's paper are—Skirrophorus, *DC.*, divided into three named sections: 1. Skirrophorus, including the species *Cunninghami, DC.*, *Preissianus, Steetz.*, *eriocaulus, Hook. fil.*, *pygmæus, Asa Gray*; 2. *Pogonolepis*, including *stricta, Steetz.*; and 3. *Pseudopappus*, including *demissus, Asa Gray*, *Nematopus effusus, Asa Gray*, *Chrisocoryne, Hugelii, Drummondii*, and *Myosuroides, Asa Gray*, and *Cephalosones gymnocephalus, Asa Gray*. All these plants are from Swan River.

Notice of 'The Gardener's Magazine of Botany,' Nos. 15 and 16, April and May, 1851.

The papers in the fifteenth number of this admirable journal are intitled—

'*Francisca confertiflora*,' being the description, history, and directions for the culture of a beautiful shrub of the order Scrophulariaceæ.'

'Vegetable Physiology;' by Arthur Henfrey, Esq., F.L.S., Lecturer on Botany at St. George's Hospital.'

'New and Rare Plants,' giving some account of their culture and appearance.

'Contributions to the Aquarium;' by Mr. George Lawson, F.R.P.S., F.B.S.E, Assistant Secretary and Curator to the Botanical Society of Edinburgh.'

'Hints on Seed Sowing;' by Mr. M. Saul, gardener to Lord Stourton, Allerton Park, Yorkshire.'

'*Hemiandra pungens*,' being the description, history, and directions for the culture of a low, shrubby, labiate plant from the Swan River.

‘Theory and Practice of Pruning; by Mr. H. Bailey, gardener to G. V. Harcourt, Esq., M.P., Nunham Park.’ This paper treats exclusively of the fig, a fruit-tree that has unaccountably obtained considerable favour of late.

‘Observations on the Aspects of Fruit Walls; by Mr. John Cox, gardener to William Wells, Esq., of Redleaf.’ In this practical and sensible paper a north aspect is recommended for cherries, currants, and gooseberries; a south aspect for peaches, nectarines, apricots, &c.

‘The Forms of Ancient Vegetation;’ translated from a paper which appeared some time back in the ‘Annales des Sciences Naturelles,’ from the pen of M. Brongniart, and subsequently in the ‘Annals and Magazine of Natural History.’

‘Texts and Comments: Plant Growing and Asparagus Culture.’

‘Suggestions of Electricity; by Mr. J. Towers, Corresponding Member of the Royal Agricultural and Horticultural Societies.’

‘*Rogiera cordata*,’ being the description and history of a showy shrub of the natural order Cinchonaceæ.

‘The Genera and Species of Cultivated Ferns; by Mr. J. Houlston, Royal Botanic Garden, Kew, and Mr. T. Moore, F.L.S.’ In this paper are described eleven species of *Drynaria*, one of *Dictymia*, two of *Drymoglossum*, two of *Tæniopsis*, one of *Antrophyum*, one of *Hemionitis*, two of *Ceratopteris*, and seven of *Elaphoglossum*, which name, given by Schott to certain species of *Acrostichum*, misleads one to connect with it the idea of the English ‘hart’s-tongue,’ of which name I need scarcely say it is an exact translation.

‘On Diagrams of the Picotee and Carnation; by Mr. G. Glenny, F.H.S.’

‘The National Floricultural Society.’

‘*Bouvardia leiantha*,’ being the description, history, and remarks on the culture of a showy free-flowering shrub, from Guatimale, of the order Cinchonaceæ.

‘The Chemistry of Soils and Manures; by Dr. A. Voelckner.’

‘On the Cultivation of *Vanda*; by Mr. T. Appleby, of the Pine Apple Nursery, London.’ *Vanda* is a genus of orchidaceous plants, with noble evergreen foliage, fine vigorous habit, and splendid fragrant blossoms.

‘On the Construction and Uses of Hygrometers; by E. J. Lowe, Esq., F.R.A.S., &c.’

‘Pomegranates in Beloochistan;’ from Hooker’s ‘Journal of Botany.’

‘The Scientific History of a Plant; by John M. Ashley, Esq., Lecturer on Chemistry to the Hunterian School of Medicine.’ A

paper exhibiting the result of rather extensive reading, and therefore praiseworthy, but the knowledge the author has thus acquired requires digesting before he can lay it with much advantage before the public.

Reports of the March meetings of the Horticultural Society.

No. 16 contains the following papers :—

‘*Polygonum vacciniifolium*,’ being a description, history, and directions for the cultivation of a small, somewhat insignificant bistort from Northern India, and first raised in 1845, in the gardens of the Horticultural Society, from seeds communicated by Captain Munro.

‘Botanical Fragments.’

‘New and Rare Plants.’

‘Meteorology in reference to Horticulture; by Mr. J. Towers, C.M.H.S., &c.’

‘On the Culture of the Venus’ Fly-trap; by Mr. Brown, of the Tooting Nursery.’

‘The Rose Garden; by Mr. G. Glenney, F.H.S.’

‘*Rhododendron cinnamomeum Cunninghami*,’ a beautiful white hybrid, raised by Mr. Cunningham, of Liverpool.

‘Vegetable Physiology; by Arthur Henfrey, Esq., F.L.S.’ A continuation of the paper already mentioned.

‘The Chemistry of Soils and Manures; by Dr. A. Voelckner. Also a continuation.

‘Edible Liliaceæ of Siberia; by Dr. Fischer; translated from the ‘*Flore des Serres*,’ &c.’ I extract this as likely to interest the readers of the ‘Phytologist.’

“The disease with which the potato has of late years been attacked has excited inquiry among botanists and agriculturists as to the plants which are most suited to replace, at least, in some measure, this precious vegetable. Unfortunately, none of the species proposed by cultivators combine all the excellent qualities of the potato—easy culture, ready and fecund propagation, abundance of nutritive matter, agreeable flavour, and easy digestion. The yam, the sweet potato, the manihot, require tropical temperatures; and their culture, which alone might be placed on a level with that of the potato, is completely excluded from northern latitudes. The *Tropæolum tuberosum* has too strong a taste; the artichoke, the merit of which in other respects is incontestible, and the oxalis are too watery; the apios requires a great deal of ground for its culture, and soon becomes hard and unpalatable; the *Psoralea esculenta* does not realize the hopes that were at one time entertained of it; the *Camassia esculenta* has, perhaps, a stronger

claim to notice than the two last of these vegetables, if, at the same time, it is readily propagated. Of all the plants cited, the *Camassia* is the only one which may be compared with the *Liliaceæ* of Siberia, which have for a very long time served as food to the inhabitants, and which therefore merit greater attention among horticulturists. The large flowered variety of the *Erythronium Dens-canis* is generally grown in the middle of Eastern Siberia, and is there prized as a most excellent article of food. Formerly, indeed, it was the custom to send an annual supply to the Court of St. Petersburg. Its propagation from seed is very easy and sure, and the plants always produce plenty, but they require three years before the bulbs attain their full size. Its local name is *kaudyk*. The lilies receive the name of *Sarauà*; and it is especially the *Lilium tenuifolium*, and the *L. Kamschatika* (*Sarauà Kamschatika*, *F.*), which are the esteemed edible species. *L. spectabile* is equally employed as a nourishing article of food. These three plants are propagated with great facility. *L. tenuifolium* is propagated almost exclusively by seed, the two others also by the scales; and it appears that every one of the scales of the bulb, which are long and pointed in *L. spectabile*, thick, short, and roundish in the *Sarauà* of Kamschatka, forms a new plant. This mode of propagation is even essential for the *Sarauà* of Kamschatka, as it rarely bears seed. There is also at Kamschatka a lily which comes near *L. canadense*, but which I name *L. avenaceum*, after the name which it bears in the country, and from the form of the scales of the bulb resembling large seeds of corn. This species is not yet introduced to gardens. In its native country it is eaten like the ordinary *Sarauà*, which is however preferred to it. In no part of Siberia are these useful plants cultivated; everywhere it is the bulb of the wild plants which is gathered, and it is gathered in abundance. *L. tenuifolium* and *L. spectabile* are first met with in the eastern part of the government of Tomsk, and extend around Baikal; and in all Siberia, in the same direction (Daouria), as far as the eastern ocean. The *Sarauà* of Kamschatka is found along the shores of the eastern ocean, and also at Kamschatka, as well as on the islands lying on the eastern side of America. It is only with very careful culture that any satisfactory results are obtained in improving it. In the south of Russia the heaths and waste lands are covered in the spring with tulip-flowers. Among these tulips there is one known well enough on the banks of the Don, in Russia, and which, perhaps, does not differ essentially from *Tulipa suaveolens*, and which is eagerly sought for and eaten by

the inhabitants, who readily distinguish it from other species which they never touch."

'Remarks on Melon Growing; by Mr. J. L. Middlemiss, gardener at Bentham Hill, Tonbridge Wells.'

'Vegetable Teratology; by Dr. Morren;' translated from '*Fuchsia*, ou Recueil d'Observations de Botanique,' &c. This paper treats of abnormal corollas of the *Calceolaria*, one of which is so interesting that I shall extract it.

"The corolla, which was nearly 4 inches in length, had the form of a Rhenish wine-flask, much elongated, straight at both extremities, inflated at the middle, the part towards the summit being contracted like the neck of a bottle; the summit of the corolla itself was still further contracted, and tapered in the form of the mouthpiece of a flute, where it split in two oval openings. The corolla, when opened, presented no trace of stamens, only the pistil of regular form was placed at its base and had its style curved to one side. The colour is not less remarkable: on the ordinary flowers of this variety of *Calceolaria*, the base is straw colour, and there is a red tinge visible at the inside, the internal cuticle being coloured red; the inferior lip is coloured with light red, but here it is the outer skin that is coloured. Now in this monstrosity the base of the corolla presented at first a yellow zone; then a broad red band in the interior, proceeding from the coloured part of the internal skin; then came a zone of pure yellow, and at the contracted part the outer skin was coloured with red; and at last the small, narrow, terminal beak was of a rich yellow. The base of the bottle-shaped corolla, it therefore appears, represented the throat of the two-lipped normal corolla, and the conical end represented the inferior lip. The hypertrophy of the bottle-shaped corolla is evidently explained by the resorption of all the male organs.

* * * * * This pelorisation would seem to be a disposition of parts in a regular form; for the *Calceolaria*, having the flower bilabiate and slippered, is irregular, and the bottle-shaped peloria is a regular form, with the exception of its extreme beak. Yet if properly considered the pelorisation is not a regular disposition of parts. Such an arrangement of a *Calceolaria* would consist of a central pistil, five stamens, a rotate corolla with five lobes alternating with the stamens, and a calyx with five teeth alternating with the corolla. Then the *Calceolaria* would pass from the family of *Scrophulariaceæ*, into that of *Solanaceæ*, and the flower would realise its regular type, its native beauty—for it cannot be denied that beauty results from symmetry, and symmetry is a disposition founded on regularity, or a harmonious

relation of numbers, parts and form. It is a remarkable law of Nature, that families that are irregular may return by these monstrous forms to their regular families; while we never see a regular flower realise the structure of an irregular one."

'*Berberis Darwinii*,' being the description, history, &c., of a *Berberis* very closely resembling the common barberry: it is found in Chiloë, Patagonia, Valdivia, and Osorno, and is named after Mr. Darwin, one, if not the earliest, of its discoverers. It is extremely floriferous, the colour being bright orange, and is recommended as a hardy and highly ornamental shrub.

'The Genera and Species of Cultivated Ferns; by Mr. J. Houlston and Mr. T. Moore.' A continuation of the paper already noticed, and fully justifying all I have said in its praise. This portion contains descriptions of two species of *Stenochlæna*, one of *Polybotrya*, one of *Olfersia*, one of *Anetium*, one of *Dictyoglossum*, one of *Acrostichum*, three of *Platycerium*, and one of *Gymnopteris*. The illustrations of these genera are excellent.

'Sacred Botany;—the Cereals.' A paper in which I have slender faith, the species particularized in our translations generally emanating from the translators. The same may be said of all papers published under the title of Sacred or Scripture Zoology.

'New Seedling Verbenas.'

'Garden Hints for Amateurs.'

'Plants and Plant Judging.'

'Progress of Horticulture.'

Meetings of the Horticultural and National Floricultural Societies.

The Analytical Sanitary Commission.

UNDER this title the 'Lancet' is publishing a series of papers on the adulteration of food, remarkable for the talent with which they are written and for the importance of the facts disclosed. Samples purchased from many shops are subjected to examinations, chemical and microscopic, and the results published at length, profusely illustrated with engravings of the microscopic appearance both of the genuine and the adulterated articles. Up to the present time these examinations have been confined to the metropolis, but the investigations are to be extended to other large towns, and the names of both honest and dishonest traders published. The second report on coffee says:

—“We propose to pass in review successively every article of food and drink, retracing our steps from time to time, and returning, as we do now, in the case of coffee, to the consideration of articles which have already attracted our attention. In this way visiting town and city, we shall perform the part of a vigilant sanitary police.” The ‘Lancet’ being a periodical exclusively addressed to medical men, is probably seldom if ever seen by the great majority of our readers; some account therefore of these papers may be of interest to them, the rather because one or two of our British plants are concerned in the matter.

Coffee is adulterated to an almost incredible extent with the farina of the Gramineæ, Leguminosæ, potato, burnt sugar to colour and conceal the other adulterations, and with chicory, the root of *Cichorium Intybus*. The processes of roasting and grinding leave enough of the anatomical structure of vegetable matter to disclose unerringly the adulterations practised. A separate report is devoted to chicory.

The Chancellor of the Exchequer having thought fit to sanction the mixture of chicory with coffee (a practice which the ‘Lancet’ severely condemns), *Cichorium Intybus* is shown to have “qualities nearly resembling those of the dandelion,” and in fact to have no nutritious properties whatever; on the contrary, “Taken as coffee by weak stomachs, it has a tendency to produce drowsiness, a feeling of weight at the stomach, and great indisposition to exertion, headache, diarrhœa.” It is remarkable that chicory itself, which is grown largely in Yorkshire, is subjected to considerable adulterations by the manufacturers. Some of the substances used for this purpose are—carrot, parsnip, mangel-wurzel, beans, roasted corn, an inferior kind of biscuit, made in Whitechapel, expressly to be roasted and ground with coffee and chicory, *dog-biscuits*, burnt sugar, called by grocers “black-jack,” and red earth. A substance has lately been introduced under the name of *coffina*: it is the seed of one of the Leguminosæ; but *acorns* appear likely to supplant this substance, on account of their very low price. Be it noticed that high-priced coffee is adulterated as well as low-priced, the amount of adulteration depending on nothing but the flexibility of the grocer’s conscience; therefore let coffee-drinkers buy coffee-mills and grind for themselves: this is their best protection. Where this is not done, the following may be useful as a rough test of the purity of coffee:—“When cold water is poured on genuine ground coffee, the liquid acquires colour only very slowly and gradually: the colour is never very deep even after prolonged maceration, and the transparency of the water is scarcely at all affected.” Adulterated

coffee, on the contrary, imparts colour to water rapidly, and also makes it opaque.

Moist sugar is sold in a very impure state, and most samples contain a peculiar *Acarus*. This interesting creature is sometimes found in vast numbers amongst the inferior kinds of sugar. The adulterations consist chiefly in a process termed "handling," *i. e.*, the artful mixture of sugars of different qualities and prices. Bad sugar stains and damps the paper containing it. This is mentioned as a good criterion of the quality of the sugar. Purchasers are recommended to use none but lump or *large-grained* white sugars.

Arrow-root is adulterated by mixing in various ways the starch granules of different plants, but the substance most employed is potato-starch. How much the public may be defrauded by this practice can be seen from the fact that the best *Maranta* arrow-root is sold at prices varying from one shilling to three shillings and sixpence per lb., while the retail price of potato arrow-root is from fourpence to sixpence. Arrow-root consists of the starch granules of the following plants:—*Maranta* or West-Indian arrow-root is obtained from the rhizome of *Maranta arundinacea*; *Curcuma*, commonly called East-Indian arrow-root, from the tubers of *Curcuma angustifolia*; *Tacca* or Otaheite arrow-root, from the tubers of *Tacca oceanica*, a native of the South-Sea Islands. "It has been sold in London for some years in packages, as 'arrow-root prepared by the native converts of the missionary stations in the South-Sea Islands.' It is sometimes spoken of as 'Williams's arrow-root,' after the missionary of that name. The slightly musty odour which it usually possesses shows that it is not in general prepared with quite the same amount of care as is bestowed on the *Maranta* arrow-root." "Arum arrow-root is procured from the tubers of *Arum maculatum*, and is prepared chiefly in Portland Island; hence it is generally called Portland arrow-root." This circumstance is alluded to by Dr. Bromfield in his excellent Hampshire Flora (*Phytol.* iii. 1011).

Pepper is very often mixed with large quantities of linseed meal and pepper dust, *i. e.*, the sweepings of the spice warehouses or the siftings of the pepper berry; wheat flour, pea flour, and sago meal are also said to be used occasionally. Some years since artificial pepper berries were ingeniously made from oil-cake, common clay, and a portion of cayenne.

Mustard is generally thought to be obtained from the seeds of *Sinapis nigra* and *alba*. The investigations of the Commission have shown that this notion is not founded on fact: every specimen exa-

mined consisted of wheat flour in large quantities, highly coloured with turmeric, and a variable but generally small quantity of genuine mustard. In some cases mustard was present only in the form of a little *husk*. In short, genuine mustard cannot be bought at any price.

Forty-four samples of wheat flour were examined, including several both of French and American flour, procured from all quarters of the metropolis, and in no case was any foreign matter detected. This announcement is gratifying, but our pleasure is destroyed when we proceed to the reports on bread. The adulterations we have hitherto considered, however injurious they may be to the pocket, have not been for the most part prejudicial to health, but it is painful to find that in the case of this first necessary of life, the adulteration usually practised cannot fail to act injuriously on the digestive organs. Bread as sold in London is largely adulterated with alum. This is done to whiten inferior flour, and to increase the weight of the bread by causing a larger quantity of water to be retained. We hope that the £20 penalty which the law inflicts for this practice will no longer be permitted to remain a dead letter. The presence of alum in bread may be thus detected:—"Take one ounce of bread; pour three ounces of distilled water over this; macerate for two hours; at the end of that time squeeze the water out of the bread, strain and filter; test with ammonia for alumina; if this substance be present, a copious white precipitate will subside, soluble in excess of potash."

We give the following extract without comment, having had no opportunity of verifying the statements here made of the development of the yeast-plant, a good account of which has long been desired by microscopic botanists:—

"The development of the yeast-plant may be divided into three very distinct and natural stages.

"*First stage, or that of Sporules.*—In this, the ordinary state in which the yeast-plant is met with, it consists entirely of sporules; these are for the most part separate, but sometimes feebly united in twos, threes, and even in greater numbers; they vary in size and form; some are several times smaller than others, and nearly all contain one or two nuclei, which are the germs of future sporules.

"*Second stage, or that of Thallus.*—After the lapse of some days, and under favourable circumstances, the sporules become much elongated; a division or partition appears in each, and it now consists of two distinct cells; the extension still continuing, other septa appear, until at length jointed threads, at first simple and undivided, after-

wards jointed, are formed, and the plant now exists in the form of root-like threads or *thallus*. The yeast-plant in the state of thallus constitutes the *Mycoderma Cerevisiæ* of Desmazières.

“*Third stage, or that of Aërial Fructification.*—After the lapse of a further time, vertical threads spring up from the thallus; these, when the plant has reached its complete development, become branched, each branch bearing at its extremity a row of rounded and beaded corpuscles. These corpuscles are about the size of the larger sporules, but differ from those bodies in their darker colour and firmer texture. Occasionally in the rows of beaded corpuscles one cell several times larger than the rest is seen. A fungus, somewhat closely resembling the yeast fungus in its perfect form, has been observed by Bennett in the expectoration of an individual attacked with pneumothorax.

“From a consideration of the structure of the sporules of the yeast-plant, their evident fungoid character, their rapid growth, &c., it occurred to us that the reason why the true or aërial reproduction had never been discovered, was to be found in the fact, that yeast being used always in the state of sporules, sufficient time was not allowed it, under ordinary circumstances, to attain its full development, for which purpose probably many days would be required.* Acting on this impression, we placed in an eight-ounce bottle a tablespoonful of malt, poured over this about four ounces of hot water, and partially closing the mouth with a perforated cork, set it aside for a fortnight. At the end of that time we were rejoiced to find that our expectations were fully realized, and that we had indeed discovered that which so many other observers had failed to detect. This discovery was made in August, 1850.”

Here for the present we take leave of these interesting and valuable reports. Our notice has been hasty and imperfect, but sufficient has been said to show that most unjustifiable practices are resorted to in the case of the above-mentioned indispensable articles of food; and we cannot refrain from asking why the law should not be called into action for the suppression of the rogueries here described? Now, these “tricks of trade” may be played with impunity; yet what difference is there morally between the direct picking of pockets, and the indirect methods of attaining the same object here described? The baker who poisons our bread, consigns mercilessly to the hands of the police the starving urchin whose necessities have driven him to abstract feloniously a penny roll from the counter; the grocer who sophisticates almost every article that leaves his shop, good man and

true! may perchance sit in judgment on that same starving urchin, and condemn him! "See how yon justice rails upon yon simple thief. Hark in thine ear:—change places; and handy-dandy, which is the justice, which is the thief?" Δ.

Extracts from the 'Proceedings of the Linnean Society.'

(Continued from Vol. iii. p. 814).

Observations on the Botany of Texas. By William Bollaert, Esq.,
F.R.G.S., &c.

IN this memoir Mr. Bollaert gives some account of the physical geography of the State of Texas, with notes on its geological character and mineral productions; he describes the soil and climate of its various regions; and, lastly, enters into a detailed account of its vegetable productions, describing successively the forests and forest-trees, together with the fruits, and the herbaceous plants, including the cereals, grasses and other plants useful to man, especially those cultivated either for food or ornament. Among these he enters into particular details with respect to the *Zea Mays* or Indian corn, and a species of *Smilax* which he believes to be new, but which appears to be identical with *Smilax lanceolata*, *L.*, and is known to the inhabitants by the name of Indian bread. Of maize he states the average crop to be sixty bushels per acre; and adds that a man and a young boy have been known in Eastern Texas to raise and gather in one year fifteen hundred bushels from two crops. He describes a great variety of modes in which this valuable plant is turned to advantage, and gives a rough analysis of the component parts of the grain. From this it results that the starchy matter in malting takes on a saccharine character, which by fermentation produces alcohol, and independently of the carbonic acid evolved, another acid is formed, which may be either a new acid or the acetic. When the fermented liquor is allowed to stand for some days, a bright yellow oil floats to the surface, and appears to be composed of three proximate substances: viz., 1. a body like elaine; 2. a small portion like stearine; and 3. a substance which he calls maizaline, which last has a decided diuretic quality, and is regarded by the author as the cause of the diuretic effects produced by maize-bread upon persons unaccustomed to its use. With regard to the Indian bread, called by the Carancahua Indians *Toqui*, Mr. Bollaert states that he found it in great abundance

in the pine-woods of Huntsville, lat. 31° N., long. $95^{\circ} 30'$ W. The edible part is the root: immediately below the stem commences the formation of irregularly-shaped potato-like tubers, rather larger than the potato, and so abundant that one plant will yield two bushels. These are used by the Indians made into a sort of bread; and the pioneer, trapper and backwoodsman are frequently obliged to have recourse to it for the same purpose, and sometimes obtain from it by fermentation a liquor of a pink colour, to which they give the name of beer. Of this plant, and of the mode of growth of its tubers, sketches accompanied the paper, which concludes with a notice of some of the botanists who have visited the State of Texas for the purpose of collecting plants, and with a list of the plants collected by Mr. Lindheimer in his earlier journey, and by Dr. Kenan.

Summary of some of the principal Results of the Investigations into the Vegetation of the Alps in connexion with Height and Temperature. By Dr. Adolph Schlagintweit.

The author stated that very remarkable differences are to be observed in the limits of the altitude of vegetation in the district of the Alps. In the *mean results* for large divisions, we may plainly recognize the influence of geographical position, as well as that of the nature of the soil, and of the massiveness of the mountain range. The limit in fact becomes higher the more we approach the southern and western groups, a phenomenon which is connected with the general changes of climate. The mean temperature varies in these latitudes from 0.5° to 0.7° of Celsius for one degree; and at the same time the isothermal lines show an evident inclination from west to east. Many very essential differences cannot, however, be explained by geographical position alone; another important influence is dependent on the form of the mountain-range, the limits of vegetation being generally connected with the mean magnitude of the elevation, and reaching higher in massive and lofty groups of Alps than in the lower chains. The favourable influence which the massiveness of the elevation exercises on the vegetation, is essentially the same as that which is also evidenced with regard to the temperature of the air and soil; and corresponds to the difference which is remarked between the climate of a plateau, and that of a ridge or free peak in the neighbourhood. In different valleys or on the spurs of a mountain remarkable differences in the altitude of the limit of vegetation often manifest

themselves according to the exposure, the direction of the wind, or the proximity of separate and extensive masses of glacier; but these influences are for the most part merely local, and the general variations of the limit of vegetation dependent on the massiveness of different groups of Alps are but little affected thereby. A comparison of the annual isotherms with the limits of vegetation proves that the different groups of vegetation do not always terminate at *the same* annual isotherm. With the exception of the beech, he showed that up to the height of Coniferæ, these limits in the Northern Alps are reached at warmer isotherms than in the Central Alps; and a somewhat lower mean temperature is observed on corresponding points of the group of Monte Rosa and Mont Blanc. This is immediately dependent on the fact that the growth of plants is not determined alone by the mean temperature of the year, but also by that of the seasons and of the months. The warmth of the summer is in this view of peculiar influence; the greater this is in connexion with the same mean temperature of the whole year, the higher plants ascend, and the colder are the annual isotherms which mark their limits. A review of all the meteorological observations made in the district of the Alps shows that in the Central Alps and in the group of Mont Blanc and Monte Rosa, the summer warmth is greater and the climate consequently more extreme than in the lower chains of the Northern Alps; by which means the relation of the limits of vegetation to the annual isotherms in these different mountain-groups is explained.

He further stated that his and his brother's investigation of the periodical development of the vegetation at heights of from 1500 to 8000 Paris feet showed among other things that the retardation of the development by the elevation is in general less during the flowering than during the ripening of the fruit; it amounts in the Alps during the former period to ten days, during the latter to twelve and a half, and on the average of the whole period of vegetation to eleven days. The mean temperature is diminished in general about 2° of Celsius for the same difference of height, during the period of the development of vegetation. From their own observations on the influence of height on the growth of Coniferæ, he concluded that in *Pinus Larix*, *P. Abies*, *P. sylvestris* and *P. Cembra*, an evident diminution in the thickness of the annual rings takes place at greater elevations. A regular diminution, however, must not be expected for each degree of elevation. Not only the variations in the temperature of the air, of the soil, and in the climate generally (which concur to disturb the Coniferæ at greater heights) produce a diminution of their yearly

growth; but the different nature of the soil has also great influence on their growth. The mass of well-decomposed earth, the presence of boulders or firm rock, the exposure of the locality, the humidity of the soil, and in some degree also its inclination, have so great an influence on the growth of the tree, and are moreover especially in the lower regions so irregularly distributed, that the influence of elevation, which should be most closely connected with the changes of climate, may be and is partially obliterated. Very frequently indeed in investigations of the geography of plants, a similar concurrence and a mutual correlation of the various causes by which the changes of vegetation are produced, are to be recognized. The observation of the progress from year to year shows that very frequently considerable variations occur in the amount of growth in separate stems. These are not, however, connected with definite years of the development, but irregularly distributed during the life of a tree. As they commonly extend over a long series of years, and do not agree in different trees for definite numbers of years, they cannot be produced by the climatic circumstances of unfavourable years. The larger oscillations of growth are dependent, on the contrary, on the nature of the soil, inasmuch as the roots during their extension meeting with more or less favourable and rocky spots, the productiveness of a tree may be essentially changed during many years.

An enumeration of all the phanerogamous plants found in the Upper Möll district (in the Tauern, in Upper Carinthia) at between 7000 to 8000 Paris feet high, and between 8500 to 10,000 feet, gave for the former region, the subnival, 224 species, for the latter, the nival, 32; while Prof. O. Heer obtained from the same regions in Glarus, in Switzerland, 219 and 12. Many families, as for example Boragineæ, Euphorbiaceæ, Geraniaceæ, Labiataë, Liliaceæ, Stellataë, Umbelliferæ, &c., compared with the lower regions and with Germany, diminish evidently and sometimes very strikingly in species in relation to the sum of Phanerogamæ. In some others no such regular differences are found in relation to height. A remarkable relative increase of species in connexion with increased elevation, is found in Saxifrageæ and Primulaceæ; and may also be remarked in Campanulaceæ, Caryophylleæ, Compositæ, Gentianeæ, and others. This depends, not on an absolute increase of species of these families, but on a diminution of the species of the other families. Monocotyledones generally diminish with height in relation to Dicotyledones; except that in the nival region and in the highest localities this proportion appears to be somewhat undefined. The covering of snow also is not completely

universal in the high regions. In spots free from snow and furnished with earth, phanerogamous plants, as well as mosses and lichens, are found far above the snow-line. Among the species which are found at the extremest limits in the Central and Southern Alps, at 10,000 to 11,000 Paris feet high, are *Androsace glacialis* and *A. Helvetica*, *Cerastium latifolium*, *Cherleria sedoides*, *Chrysanthemum alpinum*, *Gentiana Bavarica*, *Ranunculus glacialis*, *Saxifraga bryoides*, *S. oppositifolia*, *Silene acaulis*, &c. &c. The extreme limit of mosses is *in general* little above that of phanerogamous plants. The last lichens are to be found on the highest summits of the Alps, attached to projecting rocks, without any limitation of height. The number of species and varieties, up to this time between 40 and 45 *species*, which have been found in the Alps between 10,000 and 14,780 Paris feet, is not inconsiderable, but this vegetation is limited to very few spots, surrounded by extensive masses of snow. Among the *Lecideæ*, *Parmeliæ* and *Umbilicariæ*, collected by Saussure, Agassiz, and themselves, on the *highest localities*, Dr. Schlagintweit enumerated *Lecidea geographica*, *L. confluens*, *Parmelia elegans*, *P. varia*, *P. polytropa*, *Umbilicaria proboscidea*, *β. cylindrica*, &c.

Memoir on the Position of the Carpels when two and when single, including Outlines of a new Method of Arrangement of the Orders of Exogens, and Observations on the Structure of Ovaries consisting of a single Carpel. By Benj. Clarke, Esq.

In this memoir Mr. Clarke details the results of his observations on the position of single and double carpella in reference to axis, with the view of ascertaining the mode in which the reduction of the carpella from a higher number takes place, and the value of the characters thus obtained in the formation of a natural arrangement of plants. He commences with dicarpous ovaries, in which he observes three different positions in relation to axis: 1st, *right and left*, resulting generally (as he believes to be shown by an examination of the genus *Carex* and of certain *Malpighiaceæ* and *Euphorbiaceæ* from the suppression of a third and usually posterior carpellum, but occasionally also (as for example in *Lonicera*, *Fortunea*, *Diosma*, and probably *Cruciferæ*) from the abortion of the anterior and posterior carpella of an ovary originally consisting of four divisions; 2ndly, *anterior and posterior*, resulting in *Houttuynia cordata* from the disappearance of

one of the lateral carpella and the displacement of the other so as to become opposed to the persistent posterior carpellum; in *Agrimonia* and *Spiræa* (when dicarpous), from a similar suppression; as also in reduced fruits of *Reseda luteola*, &c.; 3rdly, *oblique*, which he describes as of frequent occurrence both in plants in which the carpella are generally anterior and posterior, and in those in which they are as predominantly right and left, and which he supposes to arise from the remaining lateral carpellum of a tricarpous ovary retaining nearly its original position when the other lateral carpellum has disappeared, in consequence of which the posterior carpellum is somewhat displaced, becoming obliquely posterior. He regards the single carpellum as the result of the non-development of one of the carpella of a dicarpous ovary, and its position may consequently vary in three different ways: 1st, *anterior*, as occurs in 1-carpellary ovaries of *Myrtaceæ*, *Onagrariæ*, *Polygalæ*, *Leguminosæ* and *Acanthaceæ*, to which may probably be added *Hippurideæ*, *Bruniaceæ*, &c; 2ndly, *posterior*, as in the 1-carpellary ovaries of *Houttuynia cordata* and *Piperaceæ*; 3rdly, *lateral* or *oblique*, instances of which occur in *Moreæ*, in *Elastostemma*, and in *Celtideæ*. The normal number of carpella in all ovaries he regards as three or a multiple of three; the additional series being frequently reduced by abortion in the same manner as the first, and thus giving rise to the formation of ovaries with four and five carpella. Tricarpous ovaries generally have their component parts placed two laterally and one posteriorly; but exceptions to this rule occur, as for example in *Viola*, where the third carpellum is anterior, and in *Clethra*, *Pittosporum* and *Delphinium*, in which the position of the carpella varies in the same plant.

Mr. Clarke next proceeds to consider the value of the characters derived from the position of the carpella, for which purpose he has framed a large table containing the results of long-continued observations on a multitude of exogenous plants with monocarpous or dicarpous ovaries. In this table he constitutes two primary divisions, viz., *Proterocarpous*, in which the carpella when single are anterior or lateral, never posterior; and *Heterocarpous*, in which the single carpellum is for the most part a mixture of lateral, anterior and posterior, and is rarely wholly posterior. The position of the component parts of the dicarpous ovary also appears to be more permanent in the first than in the second division. From this table Mr. Clarke deduces various inferences in relation to the systematic arrangement of plants, and the importance of the characters derived from the position of the carpella, and more especially from that of the single carpellum, which

is liable to fewer and less important exceptions. Thus for instance he considers the posterior position of the single carpellum of *Ceratophyllæ*, corresponding as it does with that of *Piperacæ* and their allies, and differing as far as known from that of any other order with which it could be associated, as a strong argument of affinity. He refers to the case of two-celled ovaries with unequal cells, and regards the superior development of the larger cell or of the corresponding stigma as indicative of what would be the position of the single carpellum, were the ovary to be so reduced. These remarks are followed by observations on the general character of his divisions and subdivisions, and by some notes on the position of carpella as regards endogenous plants and *Rhizanthæ*, and on the relation of didynamous stamens and carpella as regards their order of suppression; and the first part of the memoir concludes with some remarks on the difficulty of determining with precision the true axis of the inflorescence, and the means of obviating this difficulty in certain cases.

The second part of the memoir is more especially devoted to the consideration of ovaries consisting of a single carpellum, to the relations borne by this carpellum to the axis in various families referred by the author to each of his two principal divisions, and to the grounds from which this relation is deduced. This being entirely matter of detail is scarcely susceptible of analysis, but some of the incidental observations connected with it may properly be noticed here. Mr. Clarke states that in *Scleranthus annuus* the funiculus is uniformly posterior to the seed and on the same side with the cotyledons, in which character that plant differs from *Chenopodæ* and *Amaranthacæ*, and as far as he has been able to ascertain from *Illecebreæ*, in which the funiculus is either anterior or lateral, and the cotyledons (in pendulous seeds) on the opposite side of the seed or less frequently lateral. Of thirty-two ovaries of *Circæa alpina*, thirteen had two cells with an ovule in each, but the posterior cell constantly smaller than the anterior, in twelve the posterior cell was empty, and in seven entirely absent; and this analogy with some particularities in structure led him to regard the single cell of *Hippuris* as most probably resulting from a single anterior carpellum. He shows by a series of diagrams that the position of the fertile cell in *Valerianæ* is always lateral and external; and observes that in the genera with an irregular corolla it always bears the same relation to the irregularity of the flower. He infers from an inferiority of development of the posterior carpellum in *Stylidium graminifolium*, that if the ovary in that genus were reduced to a single carpellum, that car-

pellum would be anterior; a case which he has since found to occur in *St. adnatum*, in which there is a single anterior carpellum, or if two carpella are present the anterior only is fertile, the ovula being always attached to the posterior angle of the cell. He describes the carpellum of *Isopogon* and *Leucospermum* among *Proteaceæ* as anterior; and notes that in *Grevillea* the carpellum always alternates with the two larger sepala, but varies most extensively with reference to what he considers the axis. In *Anadenia* he states that the carpellum is always anterior in the lower half of the raceme, but varies in position towards the summit, and in rare instances is perhaps even posterior. In some species of *Acacia* also he believes that he has found instances of posterior carpella, but as the flowers were for the most part in threes, these carpella might belong to the lateral flowers. In *Pedicularis palustris* he has always found the anterior carpellum and the anterior division of the style larger than the posterior; and the same is the case with *Mendozia*, resulting in the latter instance in the suppression of the posterior carpellum in the fruit. He gives at length his reasons for regarding the carpellum as anterior in *Casuarina*, *Cannabis*, *Humulus*, *Parietaria*, *Urtica*, *Elatostemma* and *Celtis*; and he concludes his remarks on the Proterocarpous division by some observations on *Cuphea* and *Lythrum*; on *Magallana*; and on *Fumaria*.

Under the head of the Heterocarpous division he begins by recurring to the relations already mentioned as existing between *Ceratophyllum*, *Piperaceæ*, *Houttuynia* and *Chloranthus*. He then proceeds to notice *Gentianeæ*, among which he states that the dichotomous *Erythræa linarifolia* is an example of the two carpella being anterior and posterior, and infers from thence and from other variations, taken in connexion with the general statement that in this family the carpella are right and left, that their position (as in *Apocynæ* and *Loganiaceæ*, according to M. Alphonse DeCandolle) is variable. He next refers to *Broussonetia* and *Morus* and to *Stilbe*, which latter he is disposed to consider as related to *Empetreæ* and *Euphorbiaceæ*, and then proceeds to the examination of *Cupuliferæ*, among which he finds extensive variations. He refers to *Coriaria* as agreeing with *Malpighiaceæ* in having its raphe turned away from the placenta and consequently next to the dorsal rib of each carpellum, which he describes as corresponding with the general position of the funiculus in that family. He describes the carpella of *Mirabilis* as being all lateral and internal; and again notices the peculiarities which he had before referred to in the position of the funiculus in *Chenopodeæ*,

Amaranthaceæ and Illecebreæ, adding some remarks on the carpella of Polygonæ and Alsineæ. He indicates certain characters in the flower of Casearia in which it approaches Monotropa, Drosera, and especially Francoa. In Thymeleæ he finds considerable variation in the position of the carpellum, and states that the relative position of carpellum and segments of perianthium is the reverse of what takes place in Proteaceæ, the carpellum being always opposite to one of the segments of the perianthium. The tendency to the suppression of stamens in Thymeleæ is also the reverse of that of Proteaceæ, being on the side opposite to the carpellum. In Pimelea and Lachnæa he states that the carpella are all posterior, while in Daphne the carpella of the two-flowered axillæ stand with their backs to each other, or more or less turned towards the stem: Dais is a mixture of these. Lastly, he notices various peculiarities in the ovary of Sassafras officinale, in Sanguisorbeæ, in Combretum, in Aucuba Japonica and in Marlea.

The memoir was illustrated by a large tabular view of the proposed arrangement, a series of diagrams, and numerous figures.

On the various Forms of Salicornia. By Joseph Woods, Esq., F.L.S.: with some additional remarks by Richard Kippist, Esq., Libr. L.S.

The paper relates almost exclusively to the British species of Salicornia, and more particularly to those which occur on the coasts of Sussex and Hampshire.

The author begins by noticing what he considers as the typical form of *S. herbacea*. This he describes as always erect, except that late in the autumn, the branches, usually spreading or ascending, are sometimes borne down by the weight of the fruit-spikes. The colour is green, generally glaucous, but never red. The spikes of fruit are cylindrical, 2 or 3 inches long (ten to fifteen times their thickness), and contain from ten to fifteen sets of seeds.

The second form (*S. procumbens*, *Sm.*), which is stated to be more common than the first, is described as procumbent, decumbent, or ascending, but always with a bend at the top of the root, and therefore never erect: the branches and their subdivisions are much shorter and more numerous than in the typical form, and at the same time much more divaricate, the lower ones especially being frequently recurved; and these lower branches being much longer than the suc-

ceeding ones, give to the entire plant a triangular outline. The colour at maturity is always red. The spikes hardly exceed half an inch in length (about four or five times their own thickness), and contain about six sets of seeds each.

The next form noticed by Mr. Woods, and which he proposes to call *S. ramosissima*, is described as much larger than either of the preceding, erect, very much branched and bushy, of a grass-green colour, but touched with red, the branches ascending, and the spikes not cylindrical or oblong, but somewhat lanceolate, the longest about an inch in length (six or seven times their thickness), and containing about the same number of sets of seeds as *S. procumbens*. This, which appears to be a rare form, was gathered in Haling Island.

Mr. Woods now proceeds to describe two intermediate forms, apparently serving to unite the three preceding. The smallest of these, which the author proposes to designate *S. pusilla*, seems closely to resemble *S. procumbens*, from which it differs in its smaller size and less triangular outline, its erect or suberect branches, the lowest of which are neither larger nor more branched than the succeeding ones, and in its still shorter spikes, which scarcely exceed $\frac{1}{4}$ inch in length, being sometimes almost globular, and containing about five sets of seeds. The other form, which the author calls *S. intermedia*, and which is stated to be the most abundant on the muddy salt marshes of Sussex, embraces several subvarieties, all of which are erect, but vary much in other respects, sometimes resembling *S. pusilla*, but with much longer and redder spikes; in other cases approaching the typical form of *S. herbacea*, in their yellowish green colour, hardly tinged with red, cylindrical spikes an inch or more in length (eight or nine times their width), but with not more than eight or nine sets of seeds; while others again, in their bushy habit and colour, and in the form of their spikes, show an affinity to *S. ramosissima*.

All the above-mentioned varieties have oval or oblong seeds, about half as long again as broad, and thinly covered with hooked hairs, upon an even surface. In the two following the seeds are shorter, nearly globular, but covered in the same manner with hooked hairs.

S. radicans, the next species, is described as differing exceedingly in its mode of growth from any of the foregoing. In all these the root is evidently annual, and produces a single stem, which is hard, and in *S. ramosissima* may fairly be called woody. In *S. radicans*, however, a small plant, with only one or two branches, rises at first from the seed. The stem of this lies down, and, generally burying itself in the mud, sends out radical fibres and new shoots. The pro-

cess is continued from year to year, the old stems of one year becoming the rhizomes of the next, and these successively dying away as new rhizomes are formed, thus producing a very rambling and diffuse plant. In the preceding forms, every branch and subdivision is terminated by a spike of flowers. In *S. radicans* many are barren. The spikes, when they occur, are sometimes interrupted, half an inch to an inch long, and composed of about six joints. The colour is a dull greyish green, with the ends of the spikes brownish, but never red. Though much less abundant than the first, second, and fourth forms, it is by no means rare in the muddy creeks of Sussex and Hants.

The last form mentioned, under the name *S. lignosa*, bears some resemblance in its diffuse mode of growth to *S. radicans*, and Mr. Woods found some indications of radical fibres from the lower part of the stem, but was unable to ascertain positively the existence of a creeping rhizome. It differs however from *S. radicans* in the thickness, and firm solid structure of the lower part of the stem, which as in every European species is destitute of annual rings, and attains its thickness and hardness in the course of one year. From *S. fruticosa*, *L.*, to which it approaches nearly in many respects, it is distinguished by the multitude of its slender branches, and probably also by the structure of its seed, which Koch and Bertoloni describe as tubercled and not hairy in *S. fruticosa*. The spikes of our English plant are an inch or a little more in length, and about six times their width: those of the true *S. fruticosa* are usually both absolutely and relatively longer.

Mr. Woods next makes some observations on the synonymy of the *Salicornias* described by Ray, who appears originally to have admitted but two species; the first including all the forms of *S. herbacea* and also *S. procumbens*; the second attributed by Smith to *S. fruticosa*, *L.*, but now generally regarded as *S. radicans*. To these Dillenius adds three others, of which the first, *S. myosuroides procumbens*, &c., is considered by Mr. Woods as *S. radicans*; the second, *S. ramosior procumbens*, &c., as probably *S. procumbens*, *Sm.*; and the third, *S. erecta foliis brevibus cupressiformis*, he refers with some doubt to his *S. intermedia*.

Then follow some remarks on the characters of *Arthrocnemum*, a genus separated by M. Moquin-Tandon from *Salicornia*, principally on account of the different form of its embryo, and to which he refers *S. fruticosa* and *S. radicans*. In all specimens of *S. radicans*, and in some of *what is called* *S. fruticosa*, Mr. Woods finds the seeds apparently destitute of albumen, and with the radicle lying against the

edges of the cotyledons; but in the true *S. fruticosa*, supposing that name to be correctly applied only where the seed is tubercled and hairless, he finds a portion of albumen, but the extremity of the cotyledons still close to the point of the embryo.

The author concludes with the following résumé:—"If I were to sum up the results of my observations of this year on the genus *Salicornia*, I should say that *S. procumbens* is a distinct species; that *S. radicans* and *S. lignosa* are certainly specifically distinct from *S. herbacea*; but whether they are so from each other, and whether, if that be the case, *S. lignosa* ought not to be considered as a variety of *S. fruticosa*, *L.*, and the plant with tubercled seeds to be called *S. megastachya*, I do not feel competent to decide. The other forms of *S. pusilla*, *S. intermedia*, and *S. ramosissima*, may perhaps be varieties of *S. herbacea*, but this also is a subject for further investigation."

Letter from Dr. Drummond, in reference to the Observations on his views of the Linnean and Natural Systems of Botany, contained in the Notice of the Sixth Edition of the 'British Flora,' (Phytol. iv. 170).

IN your number for the present month, you make some remarks on my 'Observations on Natural Systems of Botany,' which I consider unwarrantably personal; and you will allow me to state to your readers that I am very far indeed from being the whining character you have represented. When I published that little work, I knew perfectly well that the hue and cry would be raised against it, but having no superstitious veneration for great or popular names, and as little regard for any injurious system of botany, however fashionable, or however supported by them, I published boldly what I conceived to be the truth, regardless of any fair criticism, but certainly not expecting to meet with a tide of misrepresentation.

Now I wish to inform your readers that the book contains nothing whatever to warrant you or any one else in insinuating that it was written as if the author were overwhelmed with grief (I wonder what I should cry about!), and that I used no "*dolorous terms*," made no "*lachrymose observations*," and uttered no "*lamentations*," as is represented in the 'Phytologist.'

Now, Sir, I will only say further, that I care not how severely the 'Observations' may be criticised, but let this be done in good faith,

for I must think it unfair, and of course not very honourable, to make the book a pretext for misrepresenting or maligning the author.

J. L. DRUMMOND.

Belfast, June 12, 1851.

[The review in question was from the pen of a well-known botanist, who is not likely to have mis-stated or coloured facts. I have neither seen nor heard of Dr. Drummond's work, but intend to procure it and amend my ignorance in this respect before the appearance of another number. In the mean time I only ask my readers to suspend their judgment.—*E. N.*]

Notice of the 'Botanical Gazette,' No. 30, June, 1851.

UNDER the head 'Original Communications' Mr. Henfrey reverts to his former plan of giving us in an English dress the labours of our continental brethren. The title of 'original' is, however, misapplied. He might as well have called the translated abstract of the paper by MM. Macaire and DeCandolle on the 'Direction taken by Plants' by any other name, say 'elastic' or 'waterproof.' Macaire's paper appeared in the 'Philosophical Transactions' for 1848, and reappeared in the 'Bibliothèque Universelle de Genève' for 1849, in the latter instance being accompanied by explanatory observations by Alphonse DeCandolle. The conclusion deduced from a great number of experiments, which appear to have been conducted with labour and precision, is this:—"It must be through the distension of the tissue by oxygen and the fixation of the carbon, that the leaves bend, curl or twist upon their petioles. The cause is evident, but we do not know *how* it acts."

Under the head 'Literature' the following works are noticed:—

'Outlines of the Anatomy and Physiology of the Vegetable Cell. By Prof. H. von Mohl. Brunswick, Vieweg and Son, 1851. Pp. 152, woodcuts and plate.'

'Annals of Natural History,' May, 1851.

'The Phytologist,' May, 1851.

'Botanische Zeitung,' 1850.

In these notices, with the exception of the first, the titles of the papers only are given.

‘Proceedings of Societies:’—Botanical Societies of London and Edinburgh.

‘Miscellanea:’—A note by the Rev. W. W. Spicer, of a variety of *Linaria Cymbalaria* found on the walls of Evesham churchyard, in which the flowers were pure white, excepting the front of the upper lip and the palate, which were sulphur-coloured; also the following translations:—‘Methods of preparing the Tissues of Plants for Microscopic Examination.’ ‘Bracts in the Cruciferae.’

I think Mr. Henfrey has done wisely and well in thus returning so completely to his original plan. The brief (five lines) and interesting notice by Mr. Spicer is the only article in which I have noticed any allusion to a species or variety of a British plant.

Notice of ‘The Naturalist,’ No. 4, June, 1851.

I can no longer lament as heretofore the entire absence of botanical papers; we have three in the present number, intituled as under:—

‘Note on a Botanical Stroll from Plymouth to Tamerton Foliot, returning through St. Budeaux. By Mr. Isaiah W. N. Keys.’

‘Yew Fruit. By J. Mc Intosh, Esq.’

‘Observations on the Floral Changes of the present day. By George Lawson, Esq., F.R.P.S., F.B.S.E.’

In the second of these papers Mr. Mac Intosh states that the berries of the yew may be eaten with impunity, not only by human beings, but by blackbirds, thrushes, and redbreasts. I am not aware that any doubt previously existed on this subject, but I venture to recommend the writer, who is “particularly fond of them,” to spit out the stones.

Mr. Lawson’s paper, “read before the Geological Society of Edinburgh, April 17, 1851,” is of great interest; indeed, to depreciate this able paper would be to depreciate the ‘Phytologist,’ whence most of its facts are extracted. In one instance an extract from this source amounts to a page, and is given verbatim and in inverted commas, but the work whence it has been taken is not mentioned. In this instance, as in that mentioned in the last number of the numerous and highly valuable passages the ‘Phytologist’ has supplied to Messrs. Hooker and Arnott’s ‘British Flora,’ the authors are cordially welcome to what they have taken. I have no wish but that of diffusing sound and useful information; and if writers practise the discourtesy

of concealing the source of their knowledge, it will injure their reputation much more than mine.

By the way, the 'numerous engravings' so repeatedly advertised are altogether absent from this number of the 'Naturalist.'

Notice of the 'Annals and Magazine of Natural History,' No. 42, June, 1851.

This number, besides an advertisement of the sale of the late Dr. Gardner's collection of plants and books, contains but one botanical paper: this is intituled—

'Contributions to the Botany of South America. By John Miers, Esq., F.R.S., F.L.S., &c.'

This paper is confined entirely to the genus *Cathedra*, of which two species are described, *C. rubricaulis* and *C. Gardneriana*.

Notice of Hooker's 'Journal of Botany and Kew Garden Miscellany,' No. 30, June, 1851.

The papers in the June number are intituled as follows:—

'Second Report on Mr. Spruce's Collections of Dried Plants from North Brazil; by George Bentham, Esq.'

'Decades of Fungi; by the Rev. M. J. Berkeley, M.A., F.L.S. Decade xxxv. Sikkim-Himalayan Fungi, collected by Dr. Hooker.'

'Characters of some Gnaphalioid Compositæ of the Division Angianthæ; by Asa Gray.'

'Contributions to the Botany of Western India; by N. A. Dalzell, Esq., M.A.'

'A new species of *Arnebia*, detected by Dr. J. E. Stocks in Beloochistan.'

The following papers are placed under the head 'Botanical Information':—

'The Botanic Gardens of Madrid and Valencia; by Dr. Moritz Willkomm. (Translated from the Regensburg Flora of March 7, 1851, p. 129, seq., by N. Wallich, M.D., V.P.L.S.)

'Observations upon the elevated temperature of the male inflorescence of Cycadeous Plants: communicated by Dr. W. H. de Vriese,

Professor of Botany and Director of the Royal Garden of the University of Leyden.'

'Sale of the extensive Herbarium and of the Books of the late George Gardner, Esq., F.R.S., Director of the Royal Botanic Garden, Peradenia, Ceylon.'

'Papyrus of Sicily.'

'Death of Professor Kunze.'

'Lindheimer's and Fendler's American Plants.'

'Welwitzsch's Plants of Portugal.'

Mr. Bentham's paper contains descriptions of six new species—*Davila pedicellaris*, of the order Dilleniaceæ; *Securidaca bialata* and *Trigonia parviflora*, of the order Polygaleæ; *Buttneria rhamnifolia* and *B. discolor*, of the order Buttneriaceæ; and *Arrudea bicolor*, of the order Tiliaceæ.

Asa Gray's paper contains descriptions of three new genera and eight new species of Gnaphalioid Compositæ, all of them from Swan River or South-Western Australia. The genera are *Blennospora*, *Antheidosorus* and *Chamæsphæron*; the species, *Blennospora Drummondii*, *Antheidosorus gracilis*, *Myriocephalus nudus*, *M. helichrysoides*, *Crossolepis*? *brevifolia*, *C.*? *eriocephala*, *C.*? *pygmæa*, and *Chthonocephalus Drummondii*.

Mr. Dalzell describes four new species from Western India—*Pharbitis laciniata* and *Ipomæa rhyncorhiza*, of the order Convolvulaceæ; *Elatostenium oppositifolium*, of the order Urticaceæ; and *Clausena simplicifolia*, of the order Aurantiaceæ.

Dr. Stocks describes *Arnebia fimbriopetala*.

Dr. Vriese's note on the temperature of the male inflorescence of Cycadeous plants is very interesting. "Very recently a high degree of temperature has been observed in a plant belonging to a family in which that phenomenon has not been noticed before. Mr. Teysman, chief gardener at Burtenzorg, in Java, in 1845, has informed me that he has observed an elevated temperature, and at the same time a very strong smell, in the male cone of *Cycas circinalis*. I received from him, in October, 1849, and November, 1850, seven series of observations, made in the aforesaid garden, upon male flowers of this plant. What is most remarkable in these observations is connected with the following facts. The elevation of temperature always takes place between 6—10 in the evening. Messrs. Bory, in the Isle of France, and Hasscarl, at Java, have observed the maximum at 6 in the morning. De Saussure observed it in the *Arum Italicum* between 4—7 in the evening; and the *Colocasia odora* in the gardens of Paris, Amster-

dam and Leyden has always attained its maximum at noon. This periodical production of heat, differing in different climates and in flowers of different families, has not yet been accounted for."

Notice of 'The Gardener's Magazine of Botany,' No. 17, June, 1851.

The interest of this really useful journal continues unabated. The present number contains the following papers:—

'*Pultenæa Ericoides*,' being the usual description, history, and directions for culture of a beautiful although somewhat diminutive papilionaceous shrub, raised from seed brought from Swan River by Mr. Drummond. Its leaves and habit are very much like those of a heath; its inflorescence crowded into yellow heads.

'The Metropolitan May Exhibitions.'

'Visits to Remarkable Gardens;—the suburban residence of N. B. Ward, Esq., at Clapham.' This is accompanied by an illustrative woodcut, and by the following particulars, furnished by Mr. Ward:—

"The philosophy of the growth of plants in closed cases has been so repeatedly before the public, that it is not necessary to dwell at length upon the subject. The object I had in view in the construction and planting of my large closed case, was to give a representation (in miniature of course) of a tropical forest, in which the plants were seen to be growing in something like a state of nature. The ground was prepared for their reception by covering the gravelly soil of the garden with a foot or two of old brick rubbish, and upon this about two feet of sandy peat mould. In this soil most of the palms, ferns, bamboos, bananas, &c., are planted. Some plants grow better in yellow loam, some in sand or clay, &c.; but all have their wants supplied. A very great variety of different plants can be grown in a house of this kind by a little management. Shade-loving plants thrive in the darker parts, whilst succulent plants of all kinds grow equally well suspended from the roof. All have the benefit of an atmosphere free from mechanical impurities, which might interfere with the action of the leaves; and at the same time this air is always undisturbed, enabling the plants to bear without injury very varying degrees of temperature. The thermometer in the winter months often falls to 40° during the night, rising to 100° in the day, even in the month of December, if the sun shine brightly. In summer the variations are still greater, the thermometer occasionally falling as low in

the night (in consequence of their being no fire), whilst at mid-day it is frequently as high as 130° . This high temperature, however, does not often occur, as the house is shaded by a blind. Circulation of the atmosphere is effectually secured by means of that beneficent law which compels the diffusion of the various gases which, either in a course of nature or as the result of various chemical operations, are continually being generated on the surface of the earth. By virtue of this law, the moment any gas is formed in the house, differing from the atmosphere without, diffusion immediately takes place; and that uniformity of its component parts, which philosophers have ascertained to be the case in air examined from every portion of the earth's surface, is the result. Open exposure to air is very seldom required with the majority of plants, whether natives of cold or of hot regions, if their wants are duly supplied. *Oxalis Acetosella*, *Dentaria bulbifera*, *Primula vulgaris*, *Convallaria multiflora*, *Cleodendron fragrans*, *Canna indica*, *Strelitzia Reginae*, *Begonias* and hosts of other plants, have flowered with me in closed cases for many successive years! and many fruits, particularly those of tropical regions, ripen well. The fact is, that in these cases we are enabled to include all the agents which can contribute to the well-being of the plants, and exclude those which produce deleterious effects.

"I cannot conclude without suggesting the adoption of this plan in the general cultivation of plants. Where a large number of species is required to be grown, a series of houses might contain representations of various regions of the earth, fitted up to meet the wants of the characteristic flora of each region, and forming most beautiful tableaux vivans of the aspects of the vegetable kingdom. Thus, from our miniature tropical forest we might pass to the sandy flats of the Cape of Good Hope, with its bulbs, mesembryanthemums and heaths; and thence to New Holland, with its Epacrids and beautiful Leguminosæ, &c.; and if sufficient elevation could be obtained, Teneriffe might have a place in this grand exhibition, displaying its dragon trees, laurel forests, columnar Euphorbiaceæ, Cacti, &c., &c. Each particular country might be thus represented. The Crystal Palace might well be appropriated to such a design, which would, I think, be quite as interesting as the purpose for which it was erected."

'The Ash of *Armeria maritima*.'

'New and Rare Plants,' giving many particulars of their appearance and history.

'*Erica Leeana*, var. *viridis*,' a description and excellent figure of a well-known but rarely-cultivated plant.

‘Vegetable Physiology; by Arthur Henfrey Esq., F.L.S., Lecturer on Botany at St. George’s Hospital.—Absorption.’

‘On the Habits acquired by Plants; by Mr. J. Towers, C.M.H.S., &c. &c.’

‘The Beautiful in a Tree,’ a paper extracted from the ‘Horticulturist.’

‘Cultural Agency of Quicklime; by Mr. J. Towers, C.M.H.S., &c., &c.’

‘On Variegation in Plants; by Dr. Morren, Professor in the University of Liège.—Classification, with examples among hardy plants.’ Translated from ‘*Dodonæa ou Recueil d’Observations de Botanique.*’ This classification is drawn up with a vast amount of care and patience, variegation of every possible description being defined, but that it amounts to more than a catalogue of facts, or throws light on the causes of ascertained phenomena, I am unable to assert with any degree of confidence.

‘*Episcia bicolor*,’ being the description, history, and some account of the culture of a perennial herbaceous shrub of the order Gesneraceæ, raised at the Botanic Garden at Kew four or five years ago, from seed brought by Mr. Purdie from New Granada; it is a free-blooming species, but compared with the *Gloxinias*, far from striking as an ornamental plant for cultivation.

‘The Genera and Species of Cultivated Ferns; by Mr. J. Houlston, Royal Botanic Garden, Kew, and Mr. T. Moore, F.L.S., &c.’ In this portion of the paper are described twenty-three species of *Adiantum*, twelve of *Cheilanthes*, five of *Cassebeera*, and eight of *Platyloma*. Of *Adiantum reniforme*, *A. tenerum*, *Cheilanthes viscosa*, *Cassebeera farinosa*, and *Platyloma falcata* there are characteristic figures.

‘Atmospheric Electricity; by Mr. J. Towers, C.M.H.S., &c.’

‘Natural Model for Artificial Lakes;’ extracted from Downing’s ‘*Landscape Gardening.*’

‘Seedling *Narcissi*,’ raised by Mr. E. Leeds, of Manchester, who communicates the following hints on the raising and treatment of seedling *Narcissi*:—

“To obtain good varieties it is needful the previous season to plant the roots of some of each kind in pots, and to bring them into the greenhouse in spring to flower, so as to obtain pollen of the late flowering kinds to cross with those which otherwise would have passed away before these were in flower. With me they always seed best in the open ground. When the seed-vessels begin to swell, the flower-stems should be carefully tied up and watched until the

seeds turn black. I do not wait until the seed-vessel bursts, as many seeds in that case fall to the ground and are lost, but take them off when mature with a portion of the stem, which I insert in the earth, in a seed-pot or pan provided for their reception. I place them in a north aspect, and the seeds in due season are shed as it were naturally into the pot of earth. I allow the seeds to harden for a month on the surface before covering them with half an inch depth of sandy soil. The soil should be two-thirds pure loam and one-third sharp sand: the drainage composed of rough and turfy soil. In October, I plunged the seed-pots in a cold frame facing the south; and the young plants begin to appear in December and throughout the winter, according to their kinds and the mildness of the weather. It is needful, in their earliest stages, to look well after slugs and snails.

“The seedlings should be protected from frosts, but should have abundance of air or they will soon draw. As soon as they will stand exposure, plunge the pots under some sheltered wall or hedge, and they will form their first bulbs. Let them become dry in summer, and if it be a wet season turn the pots on their side until the time for them to grow again. Let them remain in the seed-pots, and top dress them with fresh loamy soil. When the bulbs are two years old, prepare, in an open airy situation, a bed of good loam mixed with sharp sand; prepare the bed as for tulips, &c., covering the entire surface with sand, in which the bulbs should be embedded: plant the roots in rows three inches apart, and each root one inch apart in the row. They will stand three years in this bed, whence they may be finally removed into a fresh bed of similar soil to flower: a few will flower the fifth year, but the greater portion not until the seventh. I do not take up the flowering roots oftener than every third season, but top dress the beds every autumn. A little thoroughly decayed hot-bed manure mixed with the surface soil aids them to produce fine flowers, but it must be well decomposed or it will do harm. The beds should be well drained, the prepared soil at least two feet deep, and the situation sheltered from north and east winds, which do much damage to the flowers.”

I consider that botanists in their experiments of raising plants from seed, with a view of eliciting facts as to their specific identity or otherwise, would do well to take pattern by the florists in this pursuit. Nothing can exceed the care and patience bestowed on the subject by these gentlemen, and the facts they record are abundantly worthy of preservation. From the above extract, among other useful

information, we learn that the seedlings of the *Narcissus* tribe rarely flower until the seventh year.

‘Garden Hints for Amateurs.’

‘Visits to Remarkable Gardens ;—Redleaf, W. Wells, Esq.’

‘Professional and Moral Training, hints addressed to young gardeners ; by Mr. W. P. Keane, author of the ‘*Beauties of Surrey and Middlesex*’.’

‘Notes, cultural, critical and suggestive.’

‘Horticultural Society’ and ‘National Floricultural Society,’ giving an account of the meetings of the former held May 1 and 20, and of the latter held May 8 and 22.

Botanical Society of London.

Friday, June 6, 1851. J. D. Salmon, Esq., in the chair.

The following donations were announced :—

The ‘Gardener’s Magazine of Botany ;’ presented by the Editors. ‘Pharmaceutical Journal’ and ‘Transactions ;’ presented by the Society. ‘Journal of the Statistical Society of London ;’ presented by the Society.

The continuation of Mr. Daniel Stock’s paper ‘On the Botany of Bungay, Suffolk,’ was read.—*G. E. D.*

Botanical Society of Edinburgh.

Thursday, May 15, 1851. Professor Balfour, President, in the chair.

In taking the chair Professor Balfour stated, that having received inquiries from various quarters as to a criticism which had appeared of the second edition of his *Manual of Botany*, in which several glaring errors have been exposed, he considered that he was called upon, as holding the office of President of the Botanical Society, to take the opportunity of stating that he had not edited this edition. He therefore begged to assure the Society that he was not responsible for the form in which the work had appeared, nor for any inaccuracies that might occur in it.

The following donations were announced :—‘*Botanical Gazette*,’

from the Editor. British plants from Dr. Mitchell, Nottingham; Mr. J. T. Syme; Mr. Moore, Chelsea; and Mr. Thomas Anderson.

The following papers were read:—

1. ‘Biographical Notice of the late Mr. George Don. By Dr. Neill.’

2. ‘List of Plants found in Peebleshire. By George S. Blackie.’ Of the plants included in this list the following may be mentioned:—*Vicia Orobus* (Manor-head), *Galium pusillum*, *Pyrola rotundifolia*, *Primula farinosa*, *Betula nana*, *Sibbaldia procumbens* (Manor-head), *Saxifraga stellaris*, *Arctostaphylos Uva-ursi*, *Hymenophyllum Tunbridgense*, and *H. Wilsoni*.

3. ‘Notice of *Exidia hispidula*, *Bork.*, used in China as a remedy in disease, and also as an article of diet. By Dr. Dill, Brighton.’ This communication was included in a letter to Dr. Balfour, who communicated it to the Society. Dr. Dill remarks:—“The fungus which I enclose for your inspection was first brought to my notice in Hong Kong as a favourite remedy of the Chinese in attacks of dysentery. It is used by them in the form of decoction, being boiled along with dried plums, the latter being added merely to give flavour, &c., to the decoction. The first time I ever saw it used was in the case of the person who told me of its efficacy in the before-mentioned malady. This man, an English gardener, was suffering from a severe attack of dysentery, and as his house was a most unhealthy one I strongly advised his going into an hospital. He said before doing so he would like to try a Chinese medicine, which had been strongly recommended to him by an old Chinaman, a friend of his. I said, ‘Take care what you do with yourself, for your case won’t do to be trifled with.’ Three days after this I was surprised to find him at his work, and well again. ‘Sir,’ he said, ‘this medicine has had such a wonderful effect upon me that I have kept some of it to show you.’ The specimen he then gave me I handed to my Chinese servant, who seemed perfectly familiar with it, and speedily obtained me a large supply. I then determined to try it in the first case that came before me. A few days after a sailor applied to me for chronic dysentery, which had been going on for eighteen months, having contracted the malady when in China, on a previous voyage. I immediately placed him on a strong decoction of the fungus, which he took in two oz. doses, three times a day; and in eight or ten days he seemed quite cured. Being then permitted to go out, he got drunk, was exposed to night air, &c., and had a return of his malady. Again, however, the same medicine was employed with the same favourable result, and

he joined his ship in the enjoyment of recruited health. These two cases made me very sanguine of the value of the fungus as a cure in diarrhœa and dysentery, but future experience by no means realized the hopes I entertained respecting it. Since then I have so often found it fail completely, that I now regard it as being inferior in efficacy to many of the remedial agents we already possess. Mr. A. H. Balfour, in Hong Kong, has also tried it successfully, but I think his experience has been similar to my own. It grows on old dead trees and rotten timber; hence, and from its shape, the name by which it is designated in China—‘mok-yii,’ the ear of a tree. The fungus itself is much prized by the natives as an article of food on account of its mucilaginous properties. They eat it in soups, stews, &c., and consider it a great dainty. In taste it is very insipid, but certainly not more so than the far-famed bird’s-nest.”

Dr. Douglas Maclagan exhibited specimens of the plant brought from Penang by Mr. W. D. Maclagan. In that country it is called sweekiang, and is used for food.

4. ‘On Poisoning with Indian Species of *Datura*. By Dr. Herbert Giraud, Professor of Chemistry and Materia Medica in Grant Medical College, Bombay.’ Dr. Giraud had brought this subject before the Medical and Physical Society of Bombay, and the observations forming the present paper were communicated to the Botanical Society by Dr. Balfour. The very numerous cases of poisoning by *Datura* that have of late occurred in Bombay, have afforded opportunities for observing the action of a poison, of which but a scanty record is to be found in the standard works on Materia Medica and Toxicology. Several species of the genus *Datura* are indigenous throughout India: and *Datura alba* (*D. metel*, *Rox. Flora*, i. p. 561) and *D. fastuosa* (*Rox. Flora*, i. p. 561) are found growing in gardens and amongst rubbish, about villages, all over the country; although the species most familiar to Europeans, *Datura Stramonium*, is unknown here. The intoxicating properties of those plants appear to have been known amongst eastern nations from time immemorial, and they have long been employed in India, China (where *D. ferox* is used), and the islands of the Eastern Archipelago to facilitate the commission of theft and other crimes; for which nefarious purpose *Datura Stramonium* appears, of late years, to have been in some few instances employed in France and Germany. Here the cases of poisoning by the species of *Datura* are so frequent, that the natives usually recognize them by their characteristic symptoms. The motives that prompt the administration of the poison appear to be

extremely various. It is remarkable that although administered under many different circumstances, and with varied motives, it should so seldom prove fatal here; that not a single case in which the effects of *Datura* could be distinctly traced has terminated fatally; and of fifty-one cases that were treated in the Bombay Hospital during the past year, only four presented alarming symptoms. Notwithstanding the recent prevalence of *Datura*-poisoning, it has been only on the presumptive evidence of its characteristic symptoms that its action has been inferred. The poison is administered so stealthily, and the natives are so backward in aiding the cause of justice, that it is next to impossible to obtain positive evidence of the administration of the poison, or to trace it to the culprit; although, from their familiarity with its nature, and with the modes of its administration, it is evident that many of the lower orders of the people are acquainted with the adepts who employ it. These remarks, however, apply, with equal truth, to cases of poisoning by such substances as arsenic and corrosive sublimate, the presence of which may be determined by the surer methods of chemical analysis. From the information Dr. Giraud has been able to collect from natives, it would appear that the seeds are the parts of the plant usually administered. They are powdered and thrown into rice, bajree, and other grains, or mixed up with cakes and sweetmeats. Sometimes, however, an infusion or decoction of the leaves is prepared and introduced into the vessels in which food is being cooked; but of the usual quantities of the seeds employed, or of the strength of the infusion and decoction, Dr. Giraud has had no means of judging. Of the cause that has produced so sudden and remarkable an increase in the use of this poison, it is difficult to form any conjecture. Viewing the most prevalent motive to *Datura*-poisoning, it would seem as if some regularly-organized band of thieves had, within the last year, invaded our island. From 1837 and 1838, when a few cases of poisoning, supposed to be from *Datura*, were noticed by Drs. Bell and M'Lennan, in the annual reports of the Native General Hospital, up to 1848, only from six to ten such cases have been annually recorded; but during the past year fifty-one cases have come under hospital treatment.

In a note received by Dr. Cleghorn from the Superintendent of Thuggee, in Mysore, it was stated that the seeds of *Datura alba* were employed by thieves and other rogues to narcotise their victims, and deprive them of the power of resistance.

5. 'Report on the State of Vegetation in the Edinburgh Botanic Garden. By Mr. M'Nab.' Mr. M'Nab's previous observations on

the flowering of plants in the Garden up to the 10th of April, 1851, not having included the following species, which were recorded as in flower on or before that date in 1850, he presented this list, closing the observations for the season.

Dates of Flowering.

						1851.	1850.
Helonias bullata	-	-	-	-	-	April 12	April 10
Draba rupestris	-	-	-	-	-	" 13	" 4
Carex pilosa	-	-	-	-	-	" 14	" 10
„ stenophylla	-	-	-	-	-	" 14	" 5
Fritillaria Meleagris	-	-	-	-	-	" 15	" 10
Anemone Pulsatilla	-	-	-	-	-	" 16	" 3
Narcissus poeticus	-	-	-	-	-	" 17	" 10
Asphodelus tauricus	-	-	-	-	-	" 17	" 15
Narcissus pallidus	-	-	-	-	-	" 18	" 9
„ stellaris	-	-	-	-	-	" 18	" 6
Orobis canescens	-	-	-	-	-	" 18	" 5
Potentilla opaca	-	-	-	-	-	" 19	" 9
Cardamine bellidifolia	-	-	-	-	-	" 19	" 4

A note was read from Mr. Babington, stating that *Ranunculus trichophyllus*, mentioned by Mr. Syme as found near Edinburgh, is a very common form of *R. aquatilis*.

It was stated by Dr. Mitchell, in a letter to the President, that the plant called by Dr. Howitt *Œnanthe pimpinelloides*, and for which he gives several stations in his *Flora of Nottingham*, is *Œ. Lachenalii*. It is very abundant in the blue lias districts. All the Leicestershire stations for *Œ. pimpinelloides* are those of *Œ. Lachenalii*, the former not being found either in Leicestershire or Nottinghamshire. These facts render it probable that *Œ. Lachenalii* is not so "rare in fresh water" as it is said to be, both in Babington's *Manual* and in the last edition of Hooker's *Flora*; the mistake has doubtless arisen from the roots not having been examined. Specimens of the plant were sent by Dr. Mitchell, along with other specimens, from Nottingham.

Mr. M'Nab exhibited several sections of oak stems found in the course of excavations made at Tanfield, Canonmills, and read the following notice, supplied by Mr. M'Caul, who had superintended the operations:—"In the course of excavating a pit for a new gasometer nine years ago, a number of oak stems, the largest two feet in diameter, were found, of which Nos. 1 and 2 are sections. At that time I did not take any interest in such things, and therefore cannot give any accurate information regarding them. In the pit now excavating, and from eighty to ninety feet from the one alluded to, two fine trees were

found, from which the sections Nos. 3 and 4 were cut. The position they occupied was about ten feet below the original surface, beneath the lowest bed of gravel and immediately over the boulder clay, their direction being nearly east and west. Three of the pieces were lying horizontally, and two of them had a rise towards the east at an angle of 10° . At the western or lower part of these stems, roots in connexion with them could be traced, but they mouldered away to the touch." The sections exhibited have been presented by Mr. M'Caul to the museum of the Botanic Garden.

There was exhibited a large and beautiful tuft, made in wax, of *Gentiana verna*, covered with flowers, having been prepared by Miss Fraser, in imitation of a fine plant, shown at a previous meeting, from Dr. Neill's garden. The wax plant was so accurately executed that it was at first taken for a living plant. Having been presented by Miss Fraser to Mr. M'Nab, he presented it to the museum at the Botanic Garden.

A specimen of yellow-flowered *Hibiscus*, raised by Mr. Isaac Anderson from seeds sent from China by Colonel Eyre, was exhibited. The plant was about two feet high, and had a woody stem. The leaves are hairy, the petals sulphur-yellow, the flower when expanded being three to four inches across. The epicalyx consists of eight to ten linear sepals, while the calyx consists of two sepals united and thrown to one side.

A specimen of *Hyoscyamus*, raised from seeds communicated to Mr. Moore, of the Glasnevin Botanic Garden, by Major Madden, was exhibited. The plant grows in the Himalaya, and resembles *H. albus* in some respects. In the open border it attains the height of two feet. It has ovate leaves and terminal cymes. The flowers are of a dingy yellow, and the calyx is covered with glandular pubescence. Dr. Douglas MacLagan tried the effect of the plant on the eye. A single drop of the fresh juice caused dilatation of the pupil in twenty minutes, and the dilatation, with slight double vision, continued for twenty-four hours.

A curious Siberian *Iris* was exhibited by Mr. Samuel Hay. He had procured it from Mr. Cunningham, of Comely Bank, but no history was given with it. It might possibly be a hybrid.

Several interesting alpine plants were exhibited from the garden of Dr. Neill, including *Arenaria ciliata*, &c.; also a plant of *Strelitzia regina*, showing a peculiar malformation by the adhesion of the two leaves by their mid-ribs. There was likewise shown a species of *Kennedia*, which had been sent home by Commissary Neill.

Mr. Stark exhibited a number of interesting plants in flower, including *Menziesia cærulea* and *Ophrys muscifera*; also several ferns, which he had raised from spores.

Mr. Flockhart sent for exhibition a large specimen of silicified wood from New Zealand, showing well exogenous structure.

From the hothouses of the Botanic Garden there were many beautiful plants exhibited, including *Cactus crinitus*, having a peculiar fragrance, *Croton variegatum*, &c.

Dr. James Mitchell was elected Local Secretary for Nottingham, in the room of Dr. Howitt, who has gone to Australia.

Thomas Ivory, Esq., 9, Ainslie Place, was elected a Fellow.

After the meeting the members enjoyed a walk through the Botanic Garden along with Professor Balfour.

Thursday, June 19, 1851. Professor Balfour, President, in the chair.

The following donations to the Society's library and herbarium were announced:—Remarks on *Calysaccion longifolium*, *Wight*, by Dr. Cleghorn, V.P., from the Author; 'Botanical Gazette,' from the Editor; 'Report of the Royal Asiatic Society of Great Britain and Ireland,' from the Secretary, through Dr. Cleghorn; British plants from Dr. Bidwell and Mr. J. T. Syme.

A copy of the new edition of the Society's 'Catalogue of British Plants' was laid on the table.

Mr. Syme resigned his office of Curator of the Society's herbarium, in consequence of having been appointed Curator of the herbarium of the Botanical Society of London. On the motion of the President, the Society agreed to record in their minutes their sense of obligation to Mr. Syme for his valuable services, and an expression of regret that they were now to be deprived of his able assistance. The Secretary was directed to communicate this to Mr. Syme.

Mr. Wyville T. C. Thomson, Lecturer on Botany at King's College, Aberdeen, was elected Local Secretary for Aberdeen.

Mr. Henry Paul presented a specimen of *Codium Bursa*, collected in the neighbourhood of Brighton.

Dr. Balfour exhibited specimens of *Bryum Wahlenbergii* from Arniston, near Edinburgh, where they were collected by Mr. Veitch, gardener at Arniston; also specimens of *Gottschea appendiculata* from New Zealand, collected by Mr. Sinclair.

Dr. Balfour also exhibited specimens of the following species of Podostemaceæ, which had been presented to the herbarium at the

Botanic Garden by Dr. Greville:—*Podostemon rigidum*, *Gard.*, Neilgherries; *P. dichotomum*, *Gard.*, do.; *P. Wightii*, *Gard.*, do.; *P. griseum*, *Gard.*, do.; *P. elongatum*, *Gard.*, do.; *P. olivaceum*, *Gard.*, Ceylon; *P. subulatum*, *Gard.*, Ceylon; *P. Wallichii*, *R. Br.*, Assam; *Tristicha Ceylonica*, *Gard.*, Ceylon.

The following specimens, which had been presented to the museum at the Botanic Garden, were shown:—1. a large cluster of cocoa-nuts, presented by Michael Connal, Esq., Glasgow; 2. a cluster of fruit of *Elais guineensis*, the plant which yields palm-oil in Africa, presented by J. D. Anderson, Esq., of Liverpool; 3. specimens of North-American chestnuts, by the same; 4. a specimen of the fruit of *Vanilla aromatica*, ripened at Sion House, the seat of the Duke of Northumberland, presented by Mr. Ivison.

Mr. Anderson exhibited living plants of *Pinguicula grandiflora*, *Lam.*, gathered in a glen three miles from Cork, and recently sent to him by a friend.

Mr. Sibbald exhibited flowering plants of *Saxifraga hirta*, which he had received from Galtee Mohr, in the county of Tipperary, one of the few stations recorded for this species. Mr. Sibbald agreed with Mr. Babington's views as to the distinctness of *S. hirta* from *hypnoides* and *affinis*, and referred to the figures of 'English Botany' as characteristic of the plants.

The following papers were read:—

1. 'On the Government Teak Plantations of Mysore and Malabar. By Dr. Hugh Cleghorn, H.E.I.C.S.' The author exhibited specimens of teak from the plantations of Mysore and Malabar, and stated that the glory of the Ghaut Forest was its teak, the vast importance of which was becoming daily more known and appreciated; the timber, indeed, has been long prized. Bontius described the tree under the name of *Quercus Indica*, though, except as regards the timber, it has no resemblance to the oak. Rheede has given an accurate representation of *Tectona grandis*, and a good account of the teak forests of Malabar:—"Crescit ubique in Malabar, at præsertim in Provincia Calicolan (Calicut) ubi integræ sylvæ ingentium harum arborum reperiuntur. * * * Lignum vero hujus arboris, quercino ligno haud absimile, operi fabрили accomodum, atque Naupegis ad navium fabricam in usu est: sed in aquis (præsertim dulcibus) Teredini facile obnoxium." Dr. Cleghorn stated that he had travelled in 1847 the route followed by Buchanan in 1801 (see 'Journal,' vol. iii. p. 287), and that the teak forests mentioned by him had well nigh disappeared. Much attention is now given to this important article of trade by

the Government of India; plantations have been established, first in Malabar, afterwards in Mysore, and their present thriving condition gives the prospect of eventual success.

2. 'On Chantransia, *Desv.* By John Ralfs.' The species of Chantransia are fresh-water, minute, tufted Algæ, of a red, purplish, or inky colour. The proper position of this genus is doubtful. In habit and appearance some of its species agree closely with the minute, parasitic, and irregularly-branched species of Callithamnion.

3. 'Notice of *Belenia præalta* of Jacquemont. By Dr. Balfour.' Dr. B. stated that the plant exhibited by him at the last meeting as a species of *Hyoscyamus*, turns out to be the *Belenia præalta* of Jacquemont. The genus *Belenia* differs from *Hyoscyamus* in its corymbose inflorescence and more regular flowers. The plant is described and figured in Jacquemont's work. It grows on the Himalaya at great elevations, and towards the northern slope, abounding in the flat plains on the lofty summits. The plant in the Botanic Garden was raised from seeds sent by Major Madden to Mr. Moore, of Glasnevin.

4. 'Remarks on some Australian Products. By Samuel Mossman.' Mr. M. exhibited specimens of the following products, brought by him from Australia, and which he had presented to the museum at the Botanic Garden:—

1. *New-Zealand Flax*.—"This beautiful silky fibre," he remarked, "is procured from the leaves of the *Phormium tenax*, *Forst.*, by a tedious hand-process of stripping it from the parenchyma with a shell. Hitherto all attempts at preparing it by maceration, beating, and the appliances of machinery have failed in producing an article equal to that dressed in this simple manner by the aborigines. This plant grows abundantly in tufts on marshy land throughout the whole of the New-Zealand group of islands. It is manufactured into mats for clothing by the Maories, and into rope by the Europeans there, to whom it is worth about £60 per ton."

2. "*Kauri Gum*" of Commerce.—"This is a very pure resin from the *Dammara australis* or Kauri pine of New Zealand, and has been erroneously termed a gum by the settlers. The tree bears fertile and sterile cones, and sheds its bark like the *Eucalyptus* of Australia. The timber is much valued in the navy for making large and durable spars. A remarkable circumstance connected with the collecting of this resin is, that it is principally got amongst sandy soil on open fern-land, where not the vestige of a tree is to be found, a fact which indicates the existence, at a recent date, of extensive forests of this pine, having merely surface-roots on the thin soil of these islands,

deriving their nourishment mainly from the humid state of the atmosphere which characterizes that climate. It is worth £18 per ton to the Americans, who manufacture a superior quality of varnish from it."

3. "*Mimosa Bark*" of *Commerce*.—"This is the bark of *Acacia dealbata*, and pays to ship it to England, notwithstanding the distance, from the fact of its containing a greater per centage of tannin than any other bark. It is a handsome tree, from fifteen to thirty feet high, forming luxuriant groves on the banks of streams, most abundant in Port Philip and Twofold Bay, between the parallels of 34° and 38° south latitude. These groves, when in full blossom, send forth a fragrance which may be detected several miles distant, and on approaching them, they present one of the most picturesque features in Australian forest scenery."

4. *Seeds from the Cone of Araucaria Bidwillii*.—"The magnificent pine which bears these seeds, is only found between the parallels of 26° and 28° south latitude, and longitude 152°, 153° 30' east, near Moreton Bay, on the east coast of Australia. The cone is frequently found twelve inches in diameter, containing about 150 seeds, with an edible kernel as large as a walnut. The aborigines roast these seeds, crack the husk between two stones, and eat them hot. They taste something like a yam or hard dry potato. The trees bear cones only once in four years, during a period of six months. This season is held as a great festival by the aborigines of this locality, called by them Bunga Bunga, where they congregate in greater numbers than is known in any other part of Australia, frequently coming from a distance of 300 miles. They grow sleek and fat upon this diet. An act has been passed by the legislature of the colony prohibiting, under heavy pains and penalties, the demolition of these trees, being the natural food of the natives."

5. *Fossil Ferns in shale, from the coal measures of Australia*.—"Evidence has been found of the carboniferous strata running along the east coast of Australia, extending north and south a distance of 1000 miles. The veins are worked on the Hunter river, at Newcastle, and afford a valuable export at the present time to California and the neighbouring colonies."

Mr. Mossman also exhibited twenty new species of Australian plants, and remarked,—“Since Brown’s ‘*Prodromus*’ was published, in 1810, very little has been done in illustrating the botany of Australia. Few genera have been added to the list given by this eminent botanist. Although Cunningham, Labillardière, and others have added materially to our list of species, there is still a vast field open

in this interesting region to future additions in botanical discovery, as is evident from the little I have done myself in that distant land, having brought home forty new species, some of which I now exhibit. In my herbarium of ferns, is one rather interesting to the student of this department of botany. No. 667 may be considered a variety of *Stegania* (*Lomaria*) *nuda*, *R. Br.*; it has the fructification of *Lomaria*, but the venation of *Blechnum* in parts of the frond, but not in all. Sir William Hooker and Mr. J. Smith have observed it before, and do not agree with Mr. Brown entirely in his discrimination of the two genera: for example, Mr. Smith considers the *Lomaria* Spicant of Mr. Brown as a *Blechnum*, and this variety of *Lomaria nuda*, *Br.*, tends merely to show, according to him, that it too is truly a *Blechnum*, not a *Lomaria*."

Dr. Balfour made some remarks on the glandular stipules of *Cinchonaceæ*. Mr. Weddell states that on the inner surface of the base of the stipules of *Cinchona* and allied genera, he had observed numerous small glands which secreted a gummy fluid. In *Cinchonas* the secretion is transparent and fluid, while in several other genera it is solid and opaque, and seems to glue the stipules to the bud which they embrace; this is particularly the case in *Pimentelia glomerata*. In *Rondeletia* the secretion is soft, like wax, and of a beautiful green colour. The inhabitants of Peru give it the name of *Aceite-Maria* or oil of Mary; they collect it carefully, and use it as an external application in various diseases. The stipular glands have an oval or lanceolate form, and are somewhat pointed. The axis of the gland is in the form of an elongated cone; it is composed of elongated and dense cellular tissue. Dr. Balfour, with the aid of his pupil, Mr. Matthews, examined these glands in many *Cinchonaceæ*, and they detected them in fresh specimens of the following:—*Cinchona Calisaya*, *Burchellia capensis*, *Cephaëlis Ipecacuanha*, *Coffea arabica*, *Ixora javanica*, *Mussænda frondosa*, *Rondeletia speciosa*, *Pavetta indica*, *Luculia gratissima* and *Pinceana*, *Pentas carnea*, *Gardenia Stanleyana*, and other species. In some the secretion was beautifully coloured. Specimens were shown under the microscopes, as well as magnified drawings of the glands.

Dr. Balfour stated that he had recently received a letter from Dr. Walker-Arnott, in which he remarks, that in preparing spiral vessels to show them fresh, he finds the most easy plan is to take the petiole or peduncle of *Pinguicula vulgaris* and squeeze it between two glass slides, so that it may become thin and transparent. In this way a

preparation is made which, when put under the microscope, exhibits spiral vessels and annular ducts distinctly without any further trouble.

Dr. Balfour exhibited specimens of *Knappia agrostidea*, recently collected by Mr. Syme at Gullane Links, but which he had subsequently ascertained to have been sown there by several botanists at different times; as also *Ranunculus confusus*, *Gr. et G.*, from a pond at the same place; and *R. trichophyllus*, from the pools at Gullane: the latter is considered by Mr. Babington and others as a variety of *R. aquatilis*. Dr. Balfour also exhibited from Mr. Syme dried specimens of *Narcissus poeticus*, retaining the beautiful colour of the flower; the specimens had been received in a fresh state from the Rev. Mr. Bree, Allesley Rectory.

Many interesting plants were exhibited from the Botanic Garden, among which were *Solanum fragrans*, a well-flowered specimen of *Dendrobium densiflorum*, a set of Robertsonian saxifrages, alpine plants, rare *Carices*, &c.

A collection of beautiful alpine plants was likewise exhibited, from the garden of Dr. Neill, Canonmills Cottage, including *Stellaria scapigera*, *Oxyria reniformis*, and others of interest.

Mr. Stark exhibited *Stylidium androsaceum*, *Orchis muscifera*, *Aceras anthropophora*, and other interesting plants in flower; also a fresh specimen of *Trichomanes radicans*, in a state of fructification.

The following gentlemen were elected Fellows:—George S. Blackie, Esq., Alexander G. Duff, Esq., and Charles J. Davenport, Esq., Edinburgh.

Microscopical Society of London.

May 21, 1851. George Shadbolt, Esq., in the chair.

Thomas Chamberlin, Esq., Jabez Hogg, Esq., John Ladds, Esq., William Ladd, Esq., Joseph Taylor, Esq., and George Field, Esq., were balloted for and duly elected members of the Society.

A paper by George Shadbolt, Esq., ‘On the Sporangia of some of the Filamentous Fresh-water Algæ,’ was read.

After stating that the facts to which he wished to direct the attention of the Society were, if not hitherto *entirely* unknown, at any rate not made public, so far as he had been able to ascertain, the author proceeded to describe that he had ascertained that the sporangia of *Zygnema quadratum*, *Z. varians*, and of another of the Algæ, probably a species of *Tyndaridea*, undergo a gradual change of form, and finally assume a stellate character, precisely similar in appearance to

the so-called Xanthidia found in sections of flint, and analogous to the stellate sporangia of the allied family of the Desmidiæ; that consequently the figures of the sporangia of the above-named species, as given in Hassall's 'British Fresh-water Algæ,' though perfectly correct as far as they go, are only figures of the fruit in a transition state. He suggested that as Zygnema quadratum is a species in which conjugation occurs between contiguous cells of the *same* frond, while, on the contrary, in Z. varians it takes place between those of *different* filaments, in all probability a similar change to that described ensues with regard to the sporangia of all the species in both the sub-divisions of the genus, and possibly in most, if not in all, of the family.

June 18, 1851. Dr. Arthur Farre, President, in the chair.

A paper by P. H. Gosse, Esq., 'On the large Actinophrys of Eichhorn, and on the Structure of the Flesh in the Polygastrica,' was read.

After citing the observations of Eichhorn, to the effect that he witnessed the capture of small Crustacea by the tentacles of this animal, and the digestion of them within its body, which have been doubted by later naturalists, the author mentioned that he had himself met with the animal on two occasions, though it appears to have been unseen since the days of its first describer. Mr. Gosse then characterized the species, to which he assigned the name of Actinophrys Eichhornii. It is a whitish globe, distinctly visible to the naked eye, and seen, under the microscope, to be studded all over its surface with long, delicate, pointed, divergent rays. These organs have the power of arresting, by mere contact, animals of much higher organization, which the author witnessed, and thus confirmed the testimony of its discoverer. The paper went on to describe the rays as wholly retractile within the body; and other organs, in the form of clear oval bladders, also capable of being protruded and retracted at various parts of the surface; as well as vesicles contained within the substance, and which, frequently inclosing food, evidently perform the part (the author thinks only *temporarily*) of stomachs.

Mr. Gosse described the body of this animalcule as made up of an aggregation of large, distinct, perfectly transparent, unnucleated cells, pressing over and against each other, and thus rendered polygonal. Their walls are not membranous, but composed of a semifluid viscous mucus, resembling the bubbles on the surface of soapy water. This substance is endowed with contractility, which the author proved from several circumstances; and he considered that the protrusile bladders and the stomach-cells are only modifications of the common

cells of the flesh. Mr. Gosse drew analogies to illustrate this structure from the *Medusæ*, the *Hydræ*, and especially from the *Spirostoma* and the *Stylonychia*, polygastric animalcules; and his observations went to show that the organization in this class of animals is exceedingly simple, consisting of little more than a homogeneous fluid drawn out into spherical films or cells, probably inclosing a very subtle vapour.

A second paper, by H. C. Sorby, Esq., 'On the Tensions developed among the Tissues of Wood by its Growth,' was read.

The author commenced by stating that in studying the depolarizing structure of wood, he had used as a polarizer a rotatable large Nichol's prism, placed behind the lenses of the achromatic condenser; and as an analyzer, a film of selenite and another Nichol's prism, which could be rotated independently or conjointly, placed over the eye-piece. By these arrangements, he obtained abundance of light when using high powers; and by rotating the selenite, the direction of the positively and negatively doubly-refracting axes of the object under examination were easily ascertained.

Upon examining with this apparatus longitudinal sections of recent wood, with a power of about 400 linear, they were found to consist of laminæ, some of which possess positive and others negative double refraction in the line of their length, the principal axes lying one in that direction and the other at right angles to it. This alternation of positive and negative laminæ, and the probable cause, form the principal subjects of this paper. The number of alternations varies, but from five to ten are usual. The passage from one to the other is often quite sudden, but is sometimes gradual. The wood considered as the best for showing these effects was that of the *Coniferæ*; and the effects of polarization, as exhibited by the medullary rays, the disks, the spiral fibre, and the ducts were described. The cause of alternation of the positive and negative laminæ is ascribed by Mr. Sorby to the tension produced by the growth of the plant; and he explains it by supposing that first of all the original walls of the tubes of which the laminæ are composed were neutral, or had such a variable, slight, positive and negative action as is seen in cellular tissue, and that then inside them woody matter was deposited, which had a tendency to expand in the line of the length. This, by stretching the original walls, would produce in them a positive action in the line of their length, and their reaction on the fresh-formed tissue would develop in it a negative structure; and a constant repetition of this process would produce the various alternations now under consideration.

In conclusion, he stated that although these suppositions might not adequately explain all the phenomena that might be observed, still this structure proves that there have been alternations of ligneous tissue, either having tensions in different directions, or a self-existing double refraction of different characters; but he considers the supposition that the effects are due to tension agrees with the neutral action of some parts and the general properties of others much the best; and he felt convinced that the study of the double refraction of the tissues of plants would be of great utility in arriving at a correct knowledge of the manner of their development.

Another paper, 'On the Minute Structure on a Species of Fargasina,' by W. C. Williamson, Esq., was also read.

In former communications to the Society, the author pointed out the existence of a curious system of tubes and canals, penetrating the parietes and septa of several species of foraminiferous shells, in which the structure of *Polystomella*, some species of *Nonionina* and *Amphistegina* were described. On making sections of a species of *Fargasina*, *D'Orb.*, from Manilla, the existence of a much larger and more interesting arrangement of tubes was discovered. The shell is constructed on the inequilateral plan of *Truncatulina tuberculata*, and viewed as an opaque object, exhibits a series of vertical translucent spaces, with the intervening parietes to which the foramina are limited. Along each of the vertical septal lines there exists an irregular double row of very distinct pits or depressions; similar pits are also seen inferiorly in the radiating septa which divide the different segments of each convolution. On making a series of sections of the shell, we learn that these pits or depressions are the external orifices of a curious system of intraseptal canals and spaces ramifying in its interior. A section taken close to the inferior flat surface of the shells exhibits a spiral translucent septum, separating the convolutions; the segments present the ordinary foraminated aspect, and are arranged in the usual spiral manner; in the radiating interseptal lines are seen numerous small orifices, which open, by means of short canals, into the interseptal spaces immediately above them. On making a second section, parallel to the first, but a little above the peripheral margin, we perceive that there exists a number of large branching intraseptal tubes and passages, which commence at the innermost segments and proceed in a radiating manner towards the periphery; these appear designed primarily to multiply the number of external orifices; but in addition to this, they subsequently facilitate the establishment of a free communication between the internal intraseptal spaces and those

of the newer convolution, in which the septa are more numerous. Small circular apertures appear along the course of these tubes, and mark as many points where the section has traversed the orifices of the canals, descending to the inferior surface of the shell. A third section, made parallel to the foregoing, is cut through the shell a little above the superior extremities of cells belonging to the central convolutions. We here see that the portions which, in the former section, had the appearance of radiating tubes, are really the lower borders of vertical interseptal spaces, but at the same time giving off true divergent cylindrical canals from their external margins, which penetrate the thick parietes of the shell. Whilst these spaces communicate externally, they open internally into a large irregular cavity, the true nature of which is better understood by reference to a vertical section of this instructive object passing nearly through its centre; this section, if it has not traversed the primordial cell, has certainly crossed the second one, along with four others, in the successive order of their development. Whilst their inferior portions are nearly on a uniform level, the upper extremities of those belonging to successive convolutions become rapidly elongated, leaving between them a large, irregular, conical space. In the species under consideration a new and curious feature is presented: the cavities in the translucent calcareous shell are thickly lined with a dark olive-brown substance; this substance not only exists in the interior of all the cells, but also occupies the intraseptal spaces and their respective canals, as well as the irregular cavity in the umbilical centre of the shell. It is most probable that this brown substance is really the desiccated soft animal. A thin superficial section, made in the plane of the oblique sides of the conical shell, exhibits some of the septa with the large orifices of their interseptal canals, with the external parietes of some of the segments densely perforated with minute pseudopodian foramina, and a small lateral portion of the dome-like apex of the shell, which is perforated with apertures, through which a free communication is maintained between the external medium and the inclosed space. The nature of the latter varies considerably; sometimes it exists in the form of a large irregular cavity, and at others as an intricate network of large canals. The character of the external orifices also varies: in some examples they are large and patent; in others, numerous smaller tubes, ascending from the subjacent network, converge at some superficial depressions which occupy the position of the larger orifices.

The above facts show that the subject of the present memoir pre-

sents a very different structure from any of the Foraminifera hitherto described, but they support the conclusion at which the author arrived in a preceding memoir, *viz.*, that the soft animal has the power of extending itself far beyond the limits of any individual segment, and is thus enabled to secrete calcareous matter in other situations than the mere investing parietes of its own cell. It is only in this way that we can explain the production of the dome-like covering which encloses the central umbilical cavities and their ramifying canals. But if it should be ultimately proved that the soft tissues have occupied all these irregular cavities, we shall then have a form of organization which, from its great variability of contour, will approach more closely to the sponges than any hitherto described.

The author concludes by stating that although these details may appear to be tediously minute, yet it must be remembered that until we are accurately familiar with all the leading types of structure existing in this interesting group of organisms, we cannot be in a condition to arrive at final conclusions respecting their nature and zoological position.—*J. W.*

Account of a Privileged Locality near Torquay, in Devonshire.

By EDWIN LEES, Esq., F.L.S.

BOTANISTS have scarcely paid sufficient attention to those “privileged localities,” as they have been not unaptly termed, or secluded natural botanic gardens, where either some very local plant almost exclusively flourishes, or a number of plants are located together in friendly community, which may not be so met with elsewhere for many miles round. Plants found in such places may be generally taken as “certainly wild” there, without any doubt, and the flowers thus in community may be all esteemed as truly indigenous. Indeed, such spots appear to be the relics of the original vegetable aspect of the districts where they occur, and they seem to suggest that from such centres of plantation, if not creation, vegetation took its first migrations; though some plants, sluggish and unenterprising, have scarcely progressed from the spots where they were originally placed.

Such favoured habitats are peculiarly grateful to the wandering botanist to find, and it is extremely useful to notice them, as thus, in a comparatively narrow space, numerous remarkable species are localized together, which to find, even separately, might require the pacing of

the weary foot for many consecutive miles. I have in a former number of the 'Phytologist' described an excursion to Craig Brithen, one of the *privileged localities* alluded to; and I now proceed to notice another—Anstey's Cove, near Torquay, Devonshire. Authors of floras should make particular mention of such spots when within their assigned boundaries, noticing *all* the plants growing there, which might be useful in several ways, besides giving the botanical tourist, who may have but little time on his hands, an opportunity to make a good vasculum with certainty, instead of that chance wandering which often only dissipates a *dies non*.

To any visitor of South Devon, then, I recommend a day at Anstey's Cove and Babbicombe Rocks, only about two miles east of Torquay, along the coast, broken as it is into little romantic coves, with beaches of glistening white pebbles. My visitation was made in the middle of June, in the present year, probably as good a time as any, most of the plants I shall mention being then in full flower or getting into the flowering state.

The rocks in the vicinity of Torquay are of the massive limestone belonging to what geologists call the Devonian system, and are seen eastward and westward in connexion with the new red sandstone and conglomerates. At Babbicombe the limestone is brought in contact with the conglomerate, and the contrast of the deep red of the sandstone cliffs with the hoary elder rocks and the glittering white shore, over which the green sea ripples in its transparency, is very remarkable.

Anstey's Cove, which I am about to describe, is one of those delicious spots ever inviting to the imagination of the lover of secluded nature, and the hopes of the wandering herbalist; even the poet might gain some addition to his train of thoughts from the contemplation of its peculiar beauties.

Entering from the eastern side, over the down that extends to the margin of the cliff from the Torquay road, a wide portal appears in the limestone rock, a sublime indicator of the exciting scene. On either hand lofty perpendicular precipices rise upwards, almost terrifying to the sight; but Nature has robed the barren rock with beauty, and in summer the stainless flowers of the white rock-rose (*Helianthemum polifolium*) charm the eye of the explorer with their lustre and delicacy, drooping on all sides, but not descending far into the glen. From this portal a slippery staircase of rough steps winds to the cove below, which is hemmed in by the sea on one side and precipitous rocks on the other, while the uneven ground is scattered over as if with the ruins of a Cyclopean city, or some Stonehenge that an

earthquake has dislocated. Vast isolated stones rise up at high angles of inclination along the face of the escarpment, while the declivities are covered with broken cromlechs and logans, or monstrous slabs that might readily be believed to be portions of such Druidical erections. Among these masses the *Rubia peregrina* winds its stem and spreads its prickly leaves abundantly wherever a crevice presents itself; the blue *Acinos vulgaris* and the purple thyme (*Thymus Serpyllum*) are also conspicuous, and under the rocks the pale blue-veined flowers of the *Iris fœtidissima* rise amidst tufts of polished leaves, scattered about in considerable numbers.

The destructive influences of time and atmospheric action upon the rock here is shown in a yawning cavity on the right of the descent, which seems an opening to unexplored caverns, but too dangerous to penetrate, for a stone at the entrance totters to its fall, while ash and other trees, pushing in, widen the differences between rocks once joined together, till the parting is irreparable, and winding chasms tempt the ingress of the *Cotyledon* and the fern. But looking downward from this broken scene of ruinous discord, the greenish-blue sea appears in calm repose, faintly murmuring upon a beach of white pebbles below, while the rocks that enclose the eastern side rise up in shattered pinnacles of romantic shape.

At the bottom of the cove monstrous masses of rock, almost regular in shape, appear like the bases of the pillars of a ruined temple, which it might be supposed had been anciently dedicated to Solitude; Nature has overthrown it, for she would have no erections but of her own formation; and now the green privet and the greener ivy, carelessly thrown about the sea-washed masses, gives them a contrasting hue that weds beauty to abandonment. Even the samphire, dashed down from its usual lofty position, succumbs to circumstance, and fearful of another crash of ruin, luxuriates on the shore, yet just sufficiently out of the reach of the tidal surge. Far up on the face of the interior crags the *Pyrus Aria* shakes its silver leaf, and clumps of the *Viburnum Lantana* are widely dispersed around, now showing their green berries. The glaucous *Sedum*, bending its unopen heads of yellow flowers, is abundant everywhere on the broken rocky surface, and here and there appear the fully-expanded argent corollas of *Sedum Anglicum*. The golden tufts of the commoner *S. acre* also diversify the floral prospect, while numerous plants of the rose-coloured *Orchis* (*O. pyramidalis*) give quite a feature to the scene, and a few of the bee-*Orchis* (*Ophrys apifera*) luxuriate in the bright sunshine in full perfection. Nor was insect life altogether

absent, for several "painted-lady" butterflies (*Vanessa Cardui*), nowhere, I believe, very common, were sporting about, and seemed restricted to this beautiful recess.

In passing slowly on, the sea, that had previously spread its boundless view in front, becomes contracted by the junction of a mass of intervening rock with the jutting and eastern headland, and a placid lake appears in silent seclusion, seeming a retreat where the world is totally shut out, and every care shut out with it. The limestone rocks, perfectly bare though they are, above this apparent lake, and gray with high antiquity at their summits, yet from the oxydation of their surface lower down, assume a deep burnt-sienna tint, varying in its intensity, and are almost indigo at the water's edge—this variation of colour adding much to the beauty of the picture, which without it would here have but a sterile aspect, though the samphire occasionally imparts a touch of verdure to the rocks. Just at this interesting point, where the rocks meet and the sea appears to be shut in, one can scarcely do otherwise than sink down upon the turf quietly to enjoy the prospect that presents itself, and with a hermit's feelings give contemplation its fill.

Proceeding on, a fissure opens in the rocks, through which a narrow passage winds, and on emerging, another smaller cove appears even wilder than the former, with white pebbles and broken rocks on its margin, on which the surge dashes with hollow sound. But the hollows and declivities of this glen are thickly covered with vegetation, from which its shattered rocks vainly strive to escape, for they are held in its embraces, and it covers them with a vesture in almost every part. Here, wildly wandering over the steep, the wood vetch (*Vicia sylvatica*) spreads most luxuriantly around, almost bathing its purple tresses in the sea; and clustered in many spots, the beautiful blossoms of the bastard balm (*Melittis Melissophyllum*)—white, blotched with purple—appear strikingly conspicuous; while the air is loaded with fragrance from the wild honeysuckle and the sweet-briar.

Why has not some poet seized a simile from the *Melittis*?—here it is, to be worked out by any one who wants a subject. While growing, the scent of the plant is most *horehoundish* and ungrateful; but treasure it up, and as it dries no odour of hay-field in summer can be more delicious. Is it not like some adverse circumstance—bitter in its growth, but losing its acrimony with time, and at last scenting the memory? "Sweet are the uses of adversity." But it is enough to *indicate* the sentimental, though few I imagine but would imbibe poetical thought in some degree from a brief sojourn in Anstey's Cove.

This end of the cove, covered with various shrubs, quite contrasts with the bare chaotic aspect of the eastern side, before described. The acclivities rise up gently from the placid sea in tufts of verdure, yet terminate in cliffs that, though bold and broken, seem not like bare riven masses of desolation, but are softened down to the appearance of castellated ruins, where time has gently and gradually added a grace with sprinkled ferns, dangling mosses, and dimly-gilded lichens. The view, shut in except towards the sea, inspires thoughts of gentle hermits and eternal seclusion; until the nettle touch of memory quickens the slothful mind, and awakens the dreamer to the realities of life or to botanical investigation.

On the rocks at the head of Anstey's Cove, I observed a deep natural fissure in the limestone, of considerable depth, with several connected widening cracks, varying much in breadth, in some places easily stepped across, but in others quite formidable to contemplate and dangerous to stumble into. The chasm was choked up by trees, shrubs, and vegetation of various kinds, and until closely examined did not appear so deep as it really was. "Daddy's Hole," nearer to Torquay, is a wide open chasm of the same description. Such places would seem well adapted to the growth of ferns, but I only saw there such common species as *Asplenium Trichomanes*, *A. Ruta-muraria*, and *Scolopendrium vulgare*, this last being especially abundant in Devonshire. I noticed, however, some very fine plants of *Ceterach officinarum* growing in crevices of the limestone, to which it was entirely confined, notwithstanding the proximity of the red conglomerate and sandstone cliffs at Babbicombe Bay. The rocks at Babbicombe, though they have been referred to in our floras, seemed by no means so prolific of species as Anstey's Cove; but they bore in many places a very profuse investiture of that elegant moss, *Neckera crispa*.

I subjoin a list of plants gathered in two excursions to Anstey's Cove, in exemplification of its claims upon the botanical tourist; but doubtless a resident of the vicinity could greatly increase the catalogue.

Plants found in Anstey's Cove, near Torquay.

Thalictrum minus, *Arabis hirsuta*, *Cochlearia Danica*, *Brassica oleracea*.

Helianthemum polifolium. This elegant plant is stated in our floras to be only found in Britain at Babbicombe, and on Brean Down, Somerset. It presented a beautiful appearance on the rocks forming the eastern side of Anstey's Cove, but was more plentiful still at the curious spot called "Daddy's Hole," nearer to Torquay.

Silene maritima, *Hypericum montanum*, *Geranium lucidum* and *columbinum*, *Euonymus Europæus*, *Anthyllis vulneraria*, *Hippocrepis comosa*, *Vicia sylvatica* (most abundant), *Spiræa Filipendula* (in the greatest profusion, and always devoutly attached to "airy downs"), *Rosa rubiginosa* (in considerable plenty).

Pyrus Aria. Growing high up on the face of the precipitous limestone both at Anstey's Cove, Babbicombe Rocks, and Daddy's Hole. The specimens gathered here agreed pretty nearly with what I have obtained from Craig Brithen, in Montgomeryshire. Mr. Babington has recently suggested, in Henfrey's 'Botanical Gazette,' that there are two British species, and revives the old name *Scandica*. I see no advantage in this, for the alleged differences apply only to the foliage; and I find the leaves very variable on the same tree. Some stress is laid upon the lateral nerves, said to be "about 7 on each side" in *P. Scandica*; and if this character be of any worth, my plants are referrible to *Scandica*, but some of the leaves have only five lateral nerves, while they vary greatly in width and lobation. I have a specimen, gathered on the Cotswolds, Gloucestershire, with the nerves eleven, and the leaves much sharper cut, but I should have no faith in its being more than a variety. This comes nearer the celebrated Castle-Dinas plant, which is a mere seedling on the walls, than the Devonshire specimens, but I should consider them all forms of one species.

Cotyledon Umbilicus.

Sedum rupestre. In great abundance among the broken rocks both here and at Babbicombe. Very glaucous in aspect, but with none of the leaves reflexed, and considerably smaller in size than *S. reflexum*. Many of the flowers in specimens I gathered had from seven to nine petals.

Sedum Anglicum and *acre*.

Crithmum maritimum, *Daucus maritimus*, *Cornus sanguinea*, *Viburnum Lantana* (in profuse abundance), *Rubia peregrina* (very common), *Galium saxatile*, *Scabiosa Columbaria*.

The *Compositæ* were almost absent here, for I only noticed *Carduus tenuiflorus*, *Solidago Virgaurea*, and *Inula Conyza*.

Ligustrum vulgare. In great plenty on the rocks, just coming into flower. It is remarkable how the most skilful technical botanists neglect reference to exact habitat in many plants. The privet abounds on the rocks of the sea-coast both here and in Wales, yet Sir W. J. Hooker and Mr. Babington make no reference to this in

their respective floras, though surely this is its more natural position than in "hedges," to which it is assigned by the former botanist.

Orobanche Hederæ. Often difficult to obtain, but here, from the falling down of masses of ivied rocks, well observable, and its parasitical character on the roots of ivy well made out. A taller plant than *O. minor*, with more numerous flowers, extending half way down the stem.

Melittis Melissophyllum. Scattered about in luxuriant masses.

Primula veris. I have somewhere seen it stated that the cowslip does not grow in the *fields* of Devonshire. It was here, however, upon the rocks, with leaves much whiter beneath than usual, from an abundant minute tomentosity that covered them, and their petioles were excessively lengthened. I saw no primrose anywhere in the neighbourhood.

Euphorbia Portlandica. Very plentiful and in fine perfection.

Orchis pyramidalis. Splendidly in flower both here and at Babbicombe.

Ophrys apifera. In several places among the rocks.

Iris fœtidissima. One of the commonest plants of the vicinity.

I have restricted myself to the species growing at this particular locality, and must leave for the present a notice of some other Devonshire plants.

EDWIN LEES.

Cedar Terrace, Henwick, Worcester,

July 7, 1851.

Proposal for a Great City Conservatory, or Geographical, Perennial, Glazed Garden, on the site of Smithfield Market. By EDWARD NEWMAN.

SMITHFIELD Market, heretofore the monster nuisance, I might perhaps even say the monster curse, of this great metropolis, is to be removed: the House of Commons has decided on its fall. While the question of its existence was under discussion, I would not weaken the hands of those who had so long and so worthily laboured for its removal, by introducing any minor plea—any less powerful argument than that on which they took their stand. The nuisance was unrivalled in the history of nations; it was intolerable, and therefore must be removed. No ulterior consideration could add to the strength of this position; in fact, every scheme for the occupation of the site

was liable to be met by the objection, "You have, then, an ulterior object." This has been avoided: the question has been discussed on its own merits, and is decided. The occupation of the vacant site has therefore become a subject fairly open to consideration.

It will immediately occur to those who, from motives of philanthropy, have uniformly advocated the retaining of open spaces, or, as it were, breathing-holes, here and there throughout the metropolis, that another of these is now jeopardized. Such a vast area will not long remain unappropriated. The idea which I have formed on the subject, and which I am glad to find meets with general approbation amongst those to whom I have mentioned it, is to construct, on the site of the Augean stable, which a strength greater than that of Hercules is on the eve of cleansing, a geographical, perennial, glazed garden, in which shall be exhibited, in a growing state, in all their native luxuriance and beauty, the vegetable productions of the entire world. I introduce the term 'perennial' advisedly. The term 'winter' garden, so generally employed, seems to imply that it is designed to be a winter resort exclusively. Such an idea is erroneous, the term simply meaning that such a garden is to be enjoyed in winter as well as in summer: no one ever thought of restricting the use of winter gardens to the season whence their name is derived. Those citizens of London who have visited the great conservatories at Kew, Regent's Park, Sion House, &c., must be fully aware of the advantages of having such a building in the centre of the metropolis. These may be briefly enumerated under six heads: 1st, health; 2nd, comfort; 3rd, safety; 4th, instruction; 5th, amusement; 6th, accessibility.

1st. *Health*.—There is no question whatever that the health of Londoners suffers from continually and habitually staying indoors. No one, not even nursemaids and children, can go out to enjoy air, which, in our crowded streets, impregnated abundantly with particles of soot and dust, and with the fumes of beer, gin, and tobacco, is not to be enjoyed. The student, the clerk, the schoolboy, the wife, the child, cannot seek the streets as a temporary relaxation or change—cannot expect to find in them even a momentary invigoration; whereas a glazed garden would supply the desideratum, oxygen. That pabulum of animal life is abundantly exhaled by plants during the day; and not only would the invigorating effects be felt within, but they would extend, though in a less degree, all around. The consumption of oxygen, and its consequent abstraction from atmospheric air, is the main cause of that oppressive feeling which so continually causes fainting, sickness, and all kinds of illness in omnibuses, theatres, and

fashionable places of worship. The glazing would serve to arrest the escape of this life-giving principle, not *prevent* but *arrest* it, and the invigorating effect of entering the building would be at once manifest. The advantage of such buildings to invalids, especially in cases of incipient phthisis, is a matter now becoming notorious, through the recently-published views of Mr. Paxton and others; but I do not see that any of these gentlemen make the acknowledgment which common courtesy requires to Mr. Ward, with whom the idea originated. In order to set that gentleman right with the public, I beg to refer the reader to his work, published nine years ago.* After describing fully the advantage of such closed glass houses as that I am now proposing to erect, Mr. Ward goes on to consider the application of the same principle to animal and human life,—an application which he justly regards as of far higher importance than the scientific, amusing, or ornamental purposes to which the Wardian cases are now generally applied. “With respect to consumption, could we have such a place of refuge as I believe one of these closed houses would prove to be, we should then be no longer under the painful necessity of sending a beloved relative to a distant land for the remote chance of recovery, or too probably to realize the painful description of Blackwood—‘Far away from home, with strangers around him,—a language he does not understand,—doctors in whom he has no confidence,—scenery he is too ill to admire,—religious comforters in whom he has no faith,—with a deep and every day more vivid recollection of domestic scenes,—heart-broken,—home-sick,—friendless and uncared for,—he dies.’”

2nd. *Comfort*.—The great discomforts of out-of-doors life in London, arise from cold winds, rain, intense sunshine, dust, soot, filthy smells, wet muddy ground, incessant noise, &c. Now one and all of these disagreeables would be excluded from a glazed garden: cold winds, rain, dust, soot, smells, and noise would of necessity be shut out. The roof of green and corrugated glass would effectually obstruct all disagreeable effects from the sun’s rays, which, transmitted through such a medium, would not injure the most delicately-sensitive skin; and such glass, unlike all other kinds, would diminish instead of increasing the temperature. The walks, made entirely of comminuted shells, would be always dry, yet never dusty—always fit for the thinnest sole to traverse with impunity and cleanliness.

3rd. *Safety*.—There can be no doubt that a ramble in the streets

* ‘On the Growth of Plants in Closely-glazed Cases. By N. B. Ward. London: Van Voorst. 1842.’

of London is attended with great danger, and the danger, if not positively so frequent as is supposed, is still a sore trial, even in anticipation. It is but lately an infuriated bullock threw an elderly female into a two-pair window; the shaft of a furiously-driven cab has passed through the body of a man; the brains of a child have been scattered about the street by the wheels of an omnibus. Such cases as these may be rare, but broken arms and legs, from falls occasioned by compulsory contact with horses and carriages, are innumerable; and let it not be supposed the victims are the only sufferers: thousands of timid people have fled in terror from racing omnibuses and goaded cows, and although their bodies may have escaped scatheless, their minds have suffered a deep and lasting injury. From a glazed garden all such perils and thoughts of perils are absent.

4th. *Instruction*.—Such a garden might be made the means of complete instruction in botany. Is it not a part of every medical education that the pupil shall possess a competent knowledge of structural and systematic botany? In order to perfect him in the study, he is now taken to Kew, to Chelsea, to Regent's Park, or he is whisked by some railway far into the country, on the remote chance of finding the specimens in their native habitats, causing a loss of time, labour, and money that has been considered a great grievance to many young men with whom I have conversed. Here the information would be brought to him, not he to the information. Here would be a lecture-room among the objects themselves,—a lecture-room open to every professor or lecturer, on the sole condition that all within the walls at the moment should be at liberty to attend. Here the student of British botany should find living specimens of all our native plants; should have every facility allowed him to examine, dissect, and compare them. Here a committee should be formed, with the duty of alternately attending to give instructions to every inquirer; of pointing out the plants whose various parts serve as articles of food, clothing, or medicine; of exhibiting them in a manufactured as well as growing state; and of explaining by what process they are prepared for use. And not only should this committee exercise its function of tuition: every botanist, known to be such, as the subscriber to a society, or the contributor to a journal, or the curator of a garden, or the holder of any title whatever to the office of teacher, should be always at liberty to illustrate his views by the living objects before him. A knowledge of ethnology and gengraphy could also be acquired.

5th. *Amusement*.—Simply considered as a place of amusement,—a place where the seekers of pleasure might continually meet their friends, might exhibit their best dresses, lounge on the softest ottomans, listen to the best music, enjoy the scent of the sweetest and the sight of the loveliest flowers, and the shade of loaded orange-trees and of graceful palm-trees; might do all this without the usual inconvenience of late hours, heated rooms, vitiated atmosphere, certain headaches, and that dreadful feeling of *ennui* and lassitude which nocturnal revels and dissipation inevitably bring,—surely this is something to achieve. Say it is idle and frivolous, it is still the substitution of a healthful and invigorating for an unhealthy and debilitating frivolity, and this is no despicable change; indeed, I feel convinced that the right-minded will consider it exactly the reverse. Let those who will, enter the list against frivolity: I decline so Quixotic an attempt. But make frivolity beneficial, and you accomplish a very reasonable object. I would have a band, the best that could be procured, to play for two hours every Saturday afternoon during the winter and spring months, omitting only those months when the band plays in the gardens of the Zoological Society. I would on no account interfere with the prior claim of that admirable institution. By this arrangement, the company who frequented the out-of-door promenade in Regent's Park during the summer, would have the opportunity of attending the indoors garden during the winter.

6th. *Accessibility*.—Whoever will take the trouble to examine a map of London, will find that West Smithfield occupies the exact geographical centre. It is therefore equally accessible to all. Let us compare this with the situation of the Crystal Palace at Kensington, which it is proposed to convert into a vast conservatory or winter garden, open alike to pedestrians and equestrians. From the Post Office or St. Paul's it takes the traveller sixty-five minutes to reach the Crystal Palace, sixty-five minutes to return, and costs him one shilling; from the Town Hall in the Borough, the India House, or Finsbury Square, the time occupied is full ten minutes more, or seventy-five minutes in all. All these spots are in the great thoroughfares. From any less frequented part the time would be greater. Two hours and a half may be taken as a fair average of the time occupied in passing to and from a Hyde-Park conservatory; the time occupied in passing to and from the Smithfield glazed garden from the same localities, would average twenty-six minutes, supposing the visitor to walk; twenty minutes, supposing him to patronize an omnibus; sixteen minutes, supposing him to indulge in a cab. An average of two

hours' difference would occur in each journey from the most distant parts of the city to either locality, but for residents near Smithfield the difference would be far greater. Again, from Holborn there would be a vast saving of time, so also from Blackfriars' and Southwark Bridges, so also from the densely-peopled regions of St. John's Street, and so also of the entire east: indeed, it is beyond a question that, to upwards of a million of the inhabitants of London, every visit to the city glazed garden would occupy two hours less than a visit to the Hyde-Park conservatory. But this *primâ facie* saving of time and money is not all: whoever spent two hours in transit would think the time sadly wasted unless he spent four hours there, so that a day would be occupied; and in fact a visit to a Hyde-Park conservatory must, like a visit to the Great Exhibition, be a special holiday; so also whoever spent twenty minutes in transit to and from the Smithfield glazed garden would think it time wasted unless he could spend forty minutes there; thus an hour would be consumed, but no more. This would readily be afforded. Again, although time is money, yet money is money still more emphatically; the city visitors to a Hyde-Park conservatory must lay out one shilling in transit, and they must almost of necessity lay out one shilling and sixpence each in refreshments; that is the most moderate computation: the visitor to the Smithfield glazed garden would not *necessarily* incur either expense.

A few observations may be added under the heads of 'plan,' 'funds,' and 'alternative.'

Plan.—I think the roads now passing through Smithfield might be made to divide the area into six principal compartments. These I would call Europe, Asia, Africa, N. America, S. America, and New Holland. In each division I would endeavour to place the vegetable productions which are natives of the soil, and in all instances imitate as nearly as possible the natural conditions of the plants themselves; and each geographical district should be further illustrated by stuffed specimens of the quadrupeds, birds, and reptiles for which it is most remarkable; Asia by its camels, elephants, and tigers; New Holland, its cassowary, emu, and kangaroos; Africa, its giraffe, elephant, hippopotamus, lion, ostrich, and crocodiles; North America, its bison, beaver, and alligators; South America, its llama, alpaca, vicuna, and its humming-birds; Europe, its wolves, elks, and aurochs. The specimens in all instances should be the best that could be procured, regardless of cost, and should be placed amid the scenery where they once enjoyed life. The stuffing or preservation of animals is an art that has now reached something like perfection, and I would have no creature set

up for exhibition unless approved by some competent naturalist. In the centre of each compartment should be a model of the continent whose productions it exhibited, its ascertained mountains, its rivers, seas, &c., displayed in their exact proportionate height, situation, course, length, &c.; and the unknown parts, as the interior of Africa, Australia, China, &c., left a perfect blank, not thickly sown with supposititious cities, as we too frequently see them in our maps. These models should be constructed only under the superintendence of men of the highest attainments, the cost being a matter of no comparative importance, and not to be weighed for an instant against accuracy. At each of these models a demonstrator should be stationed, thoroughly qualified to give explanations, and he should hourly give such explanations unasked, in the most simple, intelligible, and unassuming manner, carefully pointing with a light wand to the part to which he was alluding. If a plant or animal of interest was peculiar to either continent, of which there are numerous instances, he should be able to point out in what particular locality it occurred, and every other fact of importance connected with its history. Thus, if asked what species of monkey was found in Europe, and where, he should be able to name the *Macacus Inuus*; to point at once to the rock of Gibraltar; and to state that this ape abounded there, feeding chiefly on the young leaves and tender shoots of the dwarf palm (*Chamærops humilis*). The plan of structure, and of connecting the various continents, need scarcely be discussed, but between continents which are connected only by water the mode of transmission should represent a ship's deck, and those which join should be united by dry land. Each continent should be further illustrated by some of its aboriginal inhabitants, in the ordinary dress of their respective countries. I imagine there would be no difficulty in procuring the Negro, the Hindoo, the Australian, the Red Indian, or the Indian of the Pampas. This idea has been already pictorially carried out in the 'Physical Atlas,' but only the very rich can see that beautiful work: this practical illustration of the idea every one should and every one would see.

Funds.—The difficulty of raising funds always stares one in the face on occasions of this kind; but it is scarcely within the scope of this preliminary notice to go into financial details. It is found possible to obtain an income of £14,000 a year for the maintenance of the gardens of the Zoological Society, in Regent's Park, at a distance of five miles from the centre of the metropolis, and presenting the single attraction of living animals; and the great secret of this income appears to lie in the judiciously-liberal expenditure. The Crystal

Palace is a still more striking instance of the success of liberality. Nothing but what I would call the judiciously-liberal expenditure could have brought the prodigious income that has been received. So, in the present instance, everything should be conducted on the most liberal scale. The choicest and most beautiful exotics, the most graceful statues, the best botanical nomenclature, should be found wherever required. The sum for the principal and first outlay must be borrowed, and government, once aware of the practicability of the scheme, would doubtless be willing to advance it. The interest on this, the ground-rent, and the cost of maintenance would be the three items of current expenditure.

I would propose having a graduated scale of subscribers and contributors.

1st. A subscriber of £10 a year should admit whom he liked and when he liked.

2nd. A subscriber of £5 a year should admit five persons on any day or every day; of £4, four persons; of £3, three persons; of £2, two persons; of £1, one person. Such introductions should be either by filling up a printed form or personally.

3rd. A subscriber of 10s. a year should admit personally his wife and children, but should give no orders.

Non-subscribers should be admitted on the following terms:—

Acknowledged botanical authors, editors of literary journals, botanical lecturers, and students of medicine with certificates of attending botanical lectures, at all times gratis.

Children in non-paying schools, introduced by a subscriber, and under suitable superintendence, gratis on Mondays and Thursdays. Children in paying schools, under similar restriction, one penny each on Tuesdays and Fridays.

Other persons should pay—

3d. Monday and Thursday.

6d. Tuesday and Friday.

1s. Wednesday and Saturday.

No money taken on Sundays, and no refreshments to be sold; no wine, beer, spirits, or tobacco to be sold or allowed at any time within the garden; and the ordinary attractions of tea-gardens, as balloons, fireworks, burning cities, volcanoes, &c., should on no account whatever be introduced.

Alternative.—It is quite certain the site of Smithfield will be occupied. If its occupation be not as proposed, it will probably be

covered with noxious factories or dense rows of an inferior kind of houses. No one will build good houses there, simply because in such a situation they would not pay. Thus the mass of brick and mortar would become yet more prodigious, the locality still more confined, the atmosphere still more unwholesome, the neighbourhood, if possible, still more degraded. On the other hand, this vast garden, frequented as it would be by a superior class of people, would improve the condition of the neighbourhood; gin-shops and beer-shops and thieves' kitchens, all of which may now be said to have their metropolis in the Smithfield district, would disappear, and the neighbourhood would improve until it became on a level with other parts of the metropolis. Support therefore may be expected from all the better class of inhabitants; they will welcome the new comer, and bid *bon voyage* to the departing disreputable dependents on drunkenness, filth, and theft.

Objections.—The first objection, and the only one that can be made by the public, is this,—“Your scheme is very fine on paper, but it can't be carried out: no plants would grow in such an atmosphere.” Leaving the ulterior difficulties of obtaining the site and the money open for future consideration, I will address myself solely to the practicability of growing plants on such a site. I, then, unhesitatingly pronounce that I would grow the most delicate plants without any difficulty in the centre of Smithfield Market, amidst all its filth and traffic, with the assistance of glass only. The most delicate and tender plant with which I am acquainted grew luxuriantly for four years in the room in which I am now writing, in a dark, narrow, close, and dirty street in one of the worst localities in London. But I am well aware that a projector is too ready to paint everything *couleur de rose*, and therefore I have fortified my cause with the highest opinion obtainable on such a subject, that of Mr. Ward, so well known as the inventor of the method of growing plants in closed cases, and who succeeded so wonderfully at his late residence in Wellclose Square. Here is Mr. Ward's reply to my inquiry, accompanying a proof of the foregoing, as to whether the locality presented any obstacle to my plan:—

“My dear Mr. Newman,—I received with much pleasure your note respecting your intended plan of converting one of the greatest nuisances of London into a closed garden, a regular oasis in the desert. It would be difficult to point out any situation where such a scheme would be of so much utility as on the site you have chosen. I cannot

better answer your inquiries respecting the growth of plants in such a situation, than by stating what, after more than twenty years' experience, I conceive may be effected in a closed case *in the worst possible locality*. Old and hackneyed as the subject has now become, I will give you, as briefly as possible, the results of my experiments. Having tried in vain to grow plants in my former residence, in one of the most smoky parts of the metropolis, I was led by accident to make experiments on their growth in closely-glazed cases, and was delighted to find all my endeavours crowned with success. One of the first practical applications of my plan, was the conveyance of plants to and from distant countries. It would be fruitless to enter into any detail of the hundreds of experiments made with reference to this point. One example will suffice. The Horticultural Society were so convinced of the efficacy of this new plan, that they sent out Mr. Fortune to China with a number of closed cases; and they were not disappointed in their expectation. Whereas in the old mode of conveyance one plant only in a thousand survived the voyage from China to England, two hundred and fifteen out of two hundred and fifty arrived in perfect health by the new method. At present the plan is universally adopted throughout the whole civilized world, and all kinds of plants can be grown *in any locality whatever*, provided due attention be paid to their natural conditions, with respect to solar light and temperature. It must likewise be borne in mind that, owing to the quiet condition of the atmosphere in the closed cases, plants, like man, will bear variations of temperature, which in open exposure would prove injurious and even fatal to them. Hence it follows, that numbers of plants belonging to more southern climes will pass through our winters with impunity when surrounded by glass.

“ Believe me to remain, very sincerely, yours,

“ N. B. WARD.

“ Clapham Rise, July 9, 1851.”

P.S.—While a proof of the foregoing was in my hands, Mr. Paxton's petition to the House of Lords, for the conversion of the Crystal Palace into a conservatory, was published in the ‘Times’ (July 12); and as this petition comprises all that has been previously said on the subject, I think that in fairness it should be appended to my proposition. Freely admitting as I do the very taking character of Mr. Paxton's proposition, it will still be observed that his scheme is open to reasonable objection, on the following grounds :—

1st. It would be a positive breach of contract, the building having been erected on its present site on the express condition that it should be removed by a certain day, and the park restored to the public use.

2nd. It would be a breach of faith with the subscribers who gave £70,000 for a specific object, totally different from the proposed application.

3rd. That the inhabitants of the parks have already access to the great conservatory of the Royal Botanic Society, to Kensington Gardens, &c., and strenuously oppose the proposed plan for making the Crystal Palace permanent; whereas every respectable inhabitant in the vicinity of Smithfield would desire a garden on that site.

4th. That to nine-tenths of the metropolis it would be useless from its distance.

Mr. Paxton's Petition.

“To the Right Hon. the Lords Spiritual and Temporal in Parliament assembled—

“The humble petition of Joseph Paxton, of Chatsworth,

“Showeth,—That the building for the Exhibition of the Works of Industry of all Nations, erected after the design of your petitioner, would, after the Exhibition is closed, supply a great public want which London, with its two and a half millions of inhabitants, stands most essentially in need of—namely, a winter park and garden under glass.

“That when your petitioner sent in a design for the Glass Palace, he had in view quite as much the after purpose for which the building could be adapted as the object then more immediately required.

“That your petitioner respectfully calls the attention of your right hon. House to the fact that within the last twenty years the physiology, economy, and requirements of animated Nature, with the effects which climate, locality, and various contingencies have upon its health and habits, have been studied and examined with the best results.

“That by the aid of chemistry and botany many useful discoveries have been made which practical horticulture has rendered subservient to the comforts and happiness of man, and that the removal of the duty on glass has given great impetus to this science; indeed, had that duty still existed, no such building could possibly have been erected.

“That the achievements of horticulture lead onwards to the forma-

tion of climates, which even under opposite influences are rendered healthy and suited to the wants and requirements of man.

“That formerly, wherever plants were congregated beneath a glass structure, the atmosphere was invariably deteriorated and rendered unfit for being more than transiently inhaled, the usual method with visitors being to take a hurried view of the chief beauties within, and then retire to a more genial air.

“That now plant structures are now no longer unhealthy, pent-up ovens, and that the objects within them grow with ease and natural vigour.

“That the ventilation and climate of our dwelling-houses have also been considered, and many additions to our comfort have in this respect been made. The perfection of these internal arrangements, contrasted with the atmosphere without, renders it still more desirable that something on a large scale should be done to counteract the effects of the outer air, which in this country, and in the neighbourhood of London especially, is often during many months of the year impure, murky, and unfit for healthy recreation and enjoyment; and it is to meet this want that your petitioner offers the present recommendation to the consideration of your right hon. House.

“That all structures hitherto erected, however great and noble some of them are, fall far short of answering this end, and that your petitioner respectfully recommends the Crystal Palace as being, in its dimensions, the best adapted for such a purpose of anything that has been hitherto attempted, and that its great advantages should be used for the public benefit.

“That the Crystal Palace, if properly laid out, will open a wide field of intellectual and healthful enjoyments, and will likewise stimulate the wealthy in large manufacturing towns to a similar adoption of what may now be raised so cheaply; and when judiciously furnished with vegetation, ornamented with sculpture and fountains, and illustrated with the beautiful works of Nature, would be pure, elevating, and beneficial in its influences on the national character.

“That at present England furnishes no such place of public resort; for although Kew has a splendid palm-house, where daily are congregated a great number of individuals, yet its warm and humid atmosphere is only calculated to admit of visitors taking a hasty view of the wonders of the tropics, as they pass in their walks through the gardens. On the contrary, in the Winter Park and Garden your petitioner proposes, climate would be the principal thing studied; all the furnishing and fitting up would have special reference to that end,

so that the pleasures found in it would be of a character which all who visit could share. Here would be supplied the climate of Southern Italy, where multitudes might ride, walk, or recline amid groves of fragrant trees; and here they might leisurely examine the works of Nature and Art, regardless of the biting east winds or the drifting snow. Here vegetation in much of its beauty might be studied with unusual advantages, and the singular properties examined of those great filterers of Nature which, during the night season, when the bulk of animal life is in a quiescent state, inhale the oxygen of the air; while in the day, when the mass of animal existence has started into activity, they drink in the carbonic supply given out by man and animals, which goes to form their solid substance; at the same time pouring forth streams of oxygen, which, mingling with the surrounding atmosphere, gives vigour to man's body and cheerfulness to his spirits.

“That in this winter park and garden the trees and plants might be so arranged as to give great diversity of views and picturesque effect, spaces might be set apart for equestrian exercise, while the main body of the building might be arranged with the view of giving great extent and variety for those who promenade on foot.

“Fountains, statuary, and every description of park and garden ornament would greatly heighten the effect and beauty of the scene. Beautiful creeping plants might be planted against the columns and trailed along the girders, so as to give shade in summer, while the effect they would produce by festooning in every diversity of form over the building would give the whole a most enchanting and gorgeous finish.

“That, besides these delightful objects, there might be introduced a collection of living birds from all temperate climates, and the science of geology, so closely connected with the study of plants, might be illustrated on a large and natural scale, thus making practical botany, ornithology, and geology familiar to the visitor.

“That should your right hon. House agree to give the public this source of public enjoyment, your petitioner would recommend that the wood boarding round the bottom tier of the building should be removed and replaced with glass, whereby the appearance would be marvellously changed; those who drive and ride in the park would, even in winter, see the objects within as they pass by, and the whole would have a light aërial appearance, totally unlike what it has at present.

“That in summer your petitioner would recommend that the whole

lower glass tier should be entirely removed, so as to give from the park and the houses opposite the Palace an appearance of continuous park and garden.

“ That the residents opposite the Crystal Palace would have within a few minutes’ walk a beautiful park, decorated with the beauties of Nature and Art, under a skyroof, having a climate warmed and ventilated for the purpose of health alone, furnishing, close to their own firesides, a promenade unequalled in the world, and for the six winter months a temperature analogous to that of Southern Italy ; and your petitioner has no doubt that the property in that immediate neighbourhood would from such an arrangement considerably advance in value, because of the recreation and exercise afforded to the inhabitants and their families.

“ That your petitioner believes many suburbs of London will be led to desire to have such a winter garden in their neighbourhoods.

“ That the advantages derivable from such an appropriation of the Crystal Palace would be many, and may be thus briefly summed up :—

“ 1. In a sanitary point of view its benefits would be incalculable.

“ 2. By its various objects it would produce a new and soothing pleasure to the mind.

“ 3. The great truths of Nature and Art would be constantly exemplified.

“ 4. Peculiar facilities would especially be given for the development, on a large scale, of the sciences of botany, geology, and ornithology.

“ 5. A temperate climate would be supplied at all seasons.

“ 6. Taste would be improved, by individuals becoming familiar with objects of the highest order of art, and by viewing the more beautiful parts of Nature without its deformities.

“ 7. Pleasant exercise could be taken at all times, and in every variety of weather.

“ 8. It would serve as a promenade or lounge, and as a place which could at all seasons be resorted to with advantage by the most delicate.

“ In conclusion, your petitioner submits, as his opinion, that, having such great public attractions, the Crystal Palace might be rendered self-supporting.

“ And your petitioner prays your right hon. House to preserve the building of the Exhibition for the public uses above submitted.

“ And your petitioner will ever pray,

“ JOSEPH PAXTON.”

In conclusion, I beg to solicit communications and suggestions from any lady or gentleman who is disposed to regard my proposition favourably.

EDWARD NEWMAN.

9, Devonshire Street, Bishopsgate,
July 13, 1851.

*Attempt to Characterize another apparently undescribed Species of
Lastrea.* By EDWARD NEWMAN.

IN describing *Lastrea multiflora*, I have said, "The stem is very stout at the base, and thickly clothed with long pointed scales, which are of a very dark brown colour along the middle, pale brown and nearly transparent at the sides;" and again, "When the fronds are young, every part of their under surface, more particularly the ribs, abounds with minute stalked glands, imparting a mealiness of appearance to the plant, which distinguishes it from *L. spinosa* as the same character separates *P. Dryopteris* and *P. calcareum*." By singular good fortune, I believe that I possess the very plants from which these descriptions were made, and I now find that the plants possessing the peculiar scales above described are without the glands, and the plants possessing the glands have somewhat different scales. Hence I conclude that although each description is in itself an exact and accurate statement of phenomena observed, it was a grave error to publish them as though they were exhibited by an individual plant then before me, and would certainly be found in combination in other plants. I am led to the detection and correction of this error by the following circumstances.

About twelve months ago, my friend William Bennett showed me some fronds of a fern gathered in Gloucestershire, which neither he nor his son E. T. Bennett could pronounce to be either *L. dilatata* or *L. spinosa*. I gave these fronds the best examination I could at the time, and found that while they possessed the general appearance as well as the glands above noticed as characteristic of *L. multiflora*, their scales or paleæ were destitute of that very peculiar dark central marking which is so conspicuous in that species. I immediately perceived that the characters of glands and paleæ which I have quoted above were in all probability faulty, but still I was reluctant to write anything on the subject until the opportunity was afforded me of seeing the living plant. This desideratum was supplied through the

kindness of Mr. Bennett, and I have watched with intense interest the unfolding of the fronds and the full development of the characters previously observed.

During this period of uncertainty, I received a collection of ferns from Mr. Purchas, of Ross, accompanied by numerous explanatory manuscript notes, kindly placed at my disposal for the forthcoming edition of the 'British Ferns.' Among these is the following:—

“*Lastrea dilatata*, Presl.—I had supposed this quite distinct from the preceding [*L. spinosa*, Newm.], until I met with a plant to be mentioned next. * * * This seems to me nearly intermediate between *L. dilatata* and *L. spinosa*, unless it should prove distinct from either. Of this curious plant you will find one or two fronds, from the only tuft yet found. * * * I need say nothing on such points as can be ascertained from dry specimens, but you may perhaps pardon my mentioning one or two points which are only evident in the fresh plant. I will premise that the root is evidently a very old one,—indeed you will perceive this from the fronds sent,—and consequently the characters afforded by the fronds may be relied on as those of a fully-developed plant. The most tangible peculiarity seems to be the great abundance of glands, which render the living stipes and rachis quite rough to the touch, and densely cover the under surface of the pinnules; they were equally present on some young plants growing close around the large one, from whose spores they had apparently originated. The pinnules of the lower part of the fronds, which shaded each other, were flat as in ordinary *L. spinosa*, but those of the upper part, which was more exposed to light, were strongly convex, yet not as those of *L. dilatata*, which grew close by and looked strikingly different. I find that the pinnules of *L. spinosa*, when removed to a sunny situation, acquire the same kind of convexity, though in a less degree. Another peculiarity, as I deemed it, was that the lower row of pinnules in the pinnæ of the upper portion of the frond, instead of being in the same plane with the rachis, like the upper row, were curved upward, at an angle of 45° with it, so as to exhibit the fruit when the frond was viewed in front. I have not seen young involucres; in their advanced state they seem to me glandulose at the margin.”

On reading these remarks, I immediately examined the living specimen, and found Mr. Purchas's statement as to the glands perfectly correct. I next examined the nascent fronds of old and undoubted specimens of *Lastrea multiflora*, and these I generally found to be without glands. I now felt convinced that the description which

I have already cited from the 'British Ferns' was incorrect, as combined with the prior description of the frond of *L. multiflora*, and that the glandulosity had been too hastily assumed to be a character of the yet undeveloped frond,—a character to be lost as the frond progressed towards maturity. Still it appears necessary to state that among a host of living examples, which through the kindness of friends I have been enabled to inspect, I find considerable discrepancy, both as to quantity of glands and also as to the distinctive character of the paleæ; yet in no instance has this discrepancy interfered with my ability to place each individual with considerable confidence either in the eglandulose species, which is generally called *multiflora*, or the glandulose species, which I now propose to call *glandulosa*. I trust that practical botanists, especially cultivators, will give the subject their best attention.

The rhizoma is decidedly tufted, the fronds radiating from a centre as in *L. multiflora*. The figure of the frond is elongate-lanceolate, presenting no appreciable difference from that of *multiflora*.

These remarks, penned after due consideration, and after having waited a reasonable time for all counter-evidence, I now offer to the attention of botanists. I am unwilling to pronounce an opinion as to the value of a character deduced from the presence or absence of glands, seeing that there is no uniform usage as regards this matter. And I must in candour remark that if we throw overboard this character of glands, the new fern is most suspiciously intermediate between *multiflora* and *spinosa*, having the habit, rhizoma, and circumscription of frond of the former, and the paleæ being scarcely distinguishable from those of the latter. The presence of such a form must inevitably reopen what might be called the great *dilatata* question, which I hoped was definitely settled among all practical men. On the other hand, however, it must be admitted that if the glands are to be ignored as a botanical character, we must ignore them also in *Polypodium Robertianum* (*calcareum*, *Sm.*), separated by Hoffmann almost exclusively on this character.

EDWARD NEWMAN.

9, Devonshire St., Bishopsgate,
July 17, 1851.

Notice of 'Species Filicum ; being Descriptions of all known Ferns. Illustrated with Plates. By SIR WILLIAM JACKSON HOOKER, K.H., LL.D., F.R.A. & L.S., &c. &c. &c., Vice-President of the Linnean Society of London, and Director of the Royal Botanic Garden of Kew. Part V., or Vol. II. Part I. London: William Pamplin, 45, Frith Street, Soho Square. 1851.'

So long a period has elapsed since the fourth part of this work issued from the press, that we fear our readers will find some difficulty in recalling that event to their remembrance. How far it is desirable to publish a connected series of technical descriptions in this disjointed and irregular manner, is a matter to be decided between the purchasing public and the selling author and publisher. We confess to a feeling of discontent as one of the former. We argue that as the periods between the appearance of successive parts increase, so does the improbability of the work's ever attaining its completion increase also: and there is, or there ought to be, something like a feeling of bounden duty to perform, of solemn engagement to keep, between the buyer and seller of a book like this. We, the buyers, do not begin to take such a work except on the understanding that it shall eventually be what its name implies, a description of all the known ferns; and should the work cease after the completion of two or three easy groups, however interesting those groups, we contend there is a breach of faith on the part of the author, for we commenced our subscription not merely for the sake of becoming acquainted with the Polypodiæ, Hymenophyllæ, and Adiantæ, with which we were already tolerably familiar, but for the sake of instruction in the more difficult genera, which, notwithstanding the labours of recent pteridologists, still remain in a state of comparative obscurity. Perhaps no one is more intimately aware than the writer of these observations, how manifold and how multifarious are the engagements of the learned author of the 'Species Filicum.' That he has no spare time for such a work, is a most patent truism: that he has done and is doing a vast amount of good in his wider and more diversified field at Kew, is also most patent. Whenever the highly-useful and highly-laborious career of Sir William Hooker shall close, and far off be the day! his fellow-countrymen will point with just pride to the amount, the utility, the applicability of his exertions. All praise and honour to such a labourer! Still it is possible to undertake too much. *Non omnia possumus omnes.* And

it is becoming more evident in each successive part of the 'Species Filicum,' both from the greater intervals and the style of execution, that the author's self-imposed task is very difficult of accomplishment. He has neither the spare time nor the spare energy which such a work imperatively demands. Under all the circumstances of the case, we could wish to see the author relieved from this undertaking; we could wish to see the work prosecuted by other hands, and the more generalizing mind of the Director of the Botanic Garden at Kew left to a freer and more appropriate exercise of its powers. Under the author's own eye at Kew are two practical botanists, already honourably known as pteridologists, and to one or both of these might be committed the conclusion of a task which seems now to be halting from the overwhelmingly-numerous avocations of its author.

Having ventured on these observations, it would be ill-judged and idle to seek out points for criticism. To seek for and even to detect errors which we have thus fully admitted must be attributed rather to want of time than to want of ability, would be most inexcusable. We have nothing therefore to say on this point, and shall only as briefly as possible recite the contents of the present part, which are as under:—

Suborder IV.—PTERIDEÆ.

Genus I.—ADIANTUM.

§ I. *Fronde simple.*

Sp. reniforme, *L.*; Asarifolium, *Willd.*; Philippense, *L.*

§ II. *Fronde pinnate, rarely subbipinnate.*

* *Sori continuous and solitary or more or less elongated and unequal.*

Sp. macrophyllum, *Sw.*; platyphyllum, *Sw.*; lucidum, *Sw.*; Seemannii, *Hook.*, a new species, very difficult to distinguish from platyphyllum,—it was brought from the Pacific side of central America, by Seemann; Phyllitidis, *J. Sm.*; Wilsoni, *Hook.*, a new species, found in shady, rather dry, and gravelly places near Bath, Jamaica, by Mr. Wilson, the intelligent Curator of the Botanic Garden at that place: it is very closely allied to Phyllitidis, *J. Sm.*

(*Veins everywhere anastomosing*).

Sp. dolosum, *Kze.*; Hewardia, *Kze.*

** *Sori suborbicular or oblong, not much elongated nor continuous.*

Sp. Kaulfussii, *Kze.*; obliquum, *Willd.*; Cubense, *Hook.*, a new

species, brought by Linden from Cuba; deltoideum, *Sw.*; Shepherdii, *Hook.*, a new species, collected in Mexico, by Mr. Bates, in 1834; lobatum, *Pr.*; Galeottianum, *Hook.*, a new species, collected in Mexico, by Galeotti; Ruezianum, *Kl.*; diaphanum, *Bl.*

(*Rachis often proliferous at the extremity of the pinnæ*).

Sp. lunulatum, *Burm.*; deflectens, *Mart.*; dolabrilforme, *Hook.*; rhizophorum, *Sw.*; soboliferum, *Wall.*; caudatum, *Linn.*; Edgeworthii, *Hook.*, a new species, collected in Adah Valley, in the Punjaub, by Mr. Edgeworth, in September, 1838; calcareum, *Gardn.*; pumilum, *Sw.*; filiforme, *Gardn.*; delicatulum, *Mart.*; rhizophytum, *Schrad.*

§ III. *Fronds bipinnate, often in the younger state pinnate.*

* *Sori elongated, more or less continuous.*

Sp. incisum, *Pr.*; pulverulentum, *L.*; serrulatum, *Linn.*; villosum, *Linn.*; varium, *H. B. K.*; falcatum, *Sw.*; obtusum, *Desv.*; hirtum, *Kl.*; Cayennense (*Willd.*), *Klotzsch*; Klotzschianum, *Hook.* = tomentosum, *Klotzsch*, the name being changed because inappropriate, a liberty we believe few botanists will entirely approve; prionophyllum, *H. B. K.*; rhomboideum, *H. B. K.*; laxum, *Kze.*; Hænkeanum, *Pr.*; fructuosum, *Spr.*; urophyllum, *Hook.*, a new species, from the Pacific coast of South America,—it may be remarked that the specific character as well as figure in this instance appear to agree very well with the ordinary form of prionophyllum, a native of the Atlantic coast of the same continent; intermedium, *Sw.*; glaucescens, *Kl.*; triangulatum, *Kaulf.*; denticulatum, *Sw.*; proximum, *Gaudich.*; Lancea, *Linn.*

§ IV. *Fronds pedately tripartite (all polysorous).*

Sp. pedatum, *Linn.*; tetragonum, *Schrad.*; curvatum, *Kaulf.*; humile, *Kze.*; patens, *Willd.*; Lindsæa, *Cav.*; angustatum, *Kaulf.*; flabellulatum, *Linn.*; hispidulum, *Sw.*

(*Veins everywhere anastomosing*).

Sp. Le Prieurii, *Hook.*, a new species, collected in Berbice, by Sir R. H. Schomburgk, and on moist declivities of the mountain Matouri, at Notaille and Oyapoch, French Guiana, by Le Prieur. This apparently distinct species does not range well with its neighbours. Is it an *Adiantum*?

(*Indistinctly pedate*).

Sp. affine, *Willd.*, a curious instance of the fallacy of a name, this species having no kind of similarity to the preceding or following.

§ IV. (V.?) *Fronde tripinnate or decompose*.

(*Sori almost invariably short, equal or nearly so, rarely continuous or elongated as in speciosum and fumarioides*).

* *Trapeziform group*.

Sp. *trapeziforme*, *Linn.*; *cultratum*, *J. Sm. MSS.*; *subcordatum*, *Sw.*; *Peruvianum*, *Kl.*; *Mathewsianum*, *Hook.*; *sinuosum*, *Gardn.*; *amplum*, *Pr.*

** *Capillus-Veneris group*.

Sp. *Capillus-Veneris*, *Linn.*; *Æthiopicum*, *Linn.*; *assimile*, *Sw.*; *pulchellum*, *Bl.*; *fumarioides*, *Willd.*; *digitatum*, *Pr.*; *emarginatum*, *Bory*; *cuneatum*, *Langsd. & Fisch.*; *glaucophyllum*, *Hook.*,—this is the *A. cuneatum*, *β. angustifolium*, of *Mart. & Galeot. Fil. Mex.* p. 70,—Sir William appears to consider it distinct as a species; *venustum*, *Don*; *fragile*, *Sw.*; *excisum*, *Kze.*; *concinnum*, *H. B. K.*; *scabrum*, *Kaulf.*; *Chilense*, *Kaulf.*; *sulphureum*, *Kaulf.*; *sessilifolium*, *Hook.*, a new species, found at Chacapoyas, Peru, by Mr. Mathews; *parvulum*, *Hook. fil.*; *Henslovianum*, *Hook. fil.*; *speciosum*, *Hook.*, a new species, found about the village of Sasarangu, El Ecuador, Pacific side, by Mr. Seemann, in August, 1847, and also by Mr. Mac Lean in Peru; *tenerum*, *Sw.*

*** *Cristatum group*.

Sp. *cristatum*, *Linn.*; *microphyllum*, *Kaulf.*; *Kunzeanum*, *Kl.*; *crenatum*, *Willd.*; *politum*, *Willd.*; *pyramidale*, *Willd.*; *polyphyllum*, *Willd.*; *macrocladum*, *Kl.*; *Wilesianum*, *Hook.*, a supposed new species, collected in Jamaica, by Mr. Wiles,—the author queries whether it may not be the *A. crenatum* of Willdenow, *Sp., Pl.* v. 446; *Brasiliense*, *Raddi*; *cardiochlæna*, *Kze.*; *Lobbianum*, *Hook.*, a new species, collected in Java, by Mr. Lobb; *formosum*, *Brown*; *Cunninghami*, *Hook.*, apparently mistaken by the late Allan Cunningham for the *A. formosum* of Brown,—it has been gathered in the Northern Island of New Zealand by Allan Cunningham, Sinclair, Colenso, Dr. Hooker, &c.; *fulvum*, *Raoul*.

Several doubtful species are also mentioned, and some of them referred to other genera; but we think, notwithstanding the labours of our author, and also those of J. Smith, Kunze, Presl, Houlston, &c., &c., that the group of ferns here standing under the generic name of *Adiantum* still require a careful and philosophical investigation, and a judicious division into genera and species.

Genus II.—OCHROPTERIS, *J. Sm.*

Sp. pallens, J. Sm.

Genus III.—LONCHITIS, *Linn.*

Sp. aurita, Sw.; *Lindeniana, Hook.*, a new species, found by Linden in Caraccas; *pubescens, Willd.*; *Natalensis, Hook.*, a new species from Port Natal, South Africa, communicated by Dr. Pappe; *glabra, Bory*; *Madagascariensis, Hook.*, a new species, from Madagascar, communicated by Dr. Lyall.

Genus III. (IV.?)—HYPOLEPIS, *Bernh.*

Sp. tenuifolia.

We sincerely desire the success of this work, but we repeat our firm conviction that its production must be more rapid than heretofore in order to meet the wishes, we might say the demands, of those whose names stand as subscribers.

Notice of 'The Transactions of the Linnean Society of London. Volume XX., Part the Third. London: Longman, 1851.'

This long-promised part has at length made its appearance, and is in all respects worthy of its predecessors. I cannot, however, conscientiously withhold the expression of my deep regret that this learned body should not perceive more clearly its own interest in matters of publication. Very many of its members receive no other return for their membership than the Transactions; they pay their subscription, three guineas annually, for this purpose only. It appears, then, a very hard, nay, an unjust thing to publish so sparingly and at such long intervals. It is unjust to subscribers, because they are thus made to pay at least six times the amount which would be required by a bookseller, this part being sold to the public at £1 10s., to members, as paid in subscriptions, at upwards of £9. It is whispered that great difficulty is experienced in getting in the subscriptions, but how can it be otherwise? In the common transactions of life a man pays very reluctantly for what he cannot obtain, and the members of publishing societies are very much on a par with the customers of a shopkeeper; they agree to pay for certain goods to be supplied, and if the supply is withheld, there is generally considered to be suffi-

cient ground for withholding the payment also. It is unjust also to contributors to delay the publication of their discoveries for such an unreasonable length of time; the dates of those contained in this part range from January 20, 1846,—five years and a half,—to June 20, 1848,—three years. Surely this is an unwarrantable delay. When we reflect on the antiquity of this Society, on the high scientific standing of many of its members, on the acknowledged value of its Transactions, on the extent of its library and herbaria, comprising *inter alia* those of Linneus and Smith, it cannot but be a matter of regret to all right-minded men of science to see it sinking, as it were, into a state of lethargy and inanity. Let the managers reflect that these are dangerous symptoms,—symptoms of approaching dissolution. The Zoological Society, after reaching a similar state of mesmeric coma, has been aroused and resuscitated by the single-handed exertions of one man; the tide of exuberant life again flows through its veins; its pristine vigour has returned: it has indeed slumbered, but it has arisen from its slumber “as a giant refreshed.” Sincerely do I hope it may be thus with the Linnean Society; that it too may have its regenerator, its arouser; that the somnolency which at present oppresses it may not be the sleep of death.

The botanical papers in this part are intituled as below:—

‘Note on *Samara læta*, *Linn.* By G. A. Walker-Arnott, LL.D., F.L.S., &c., Reg. Prof. of Botany in the University of Glasgow.’

‘On a new Genus of Plants, of the Family of *Burmanniaceæ*. By John Miers, F.R.S., F.L.S., &c.’

Two species are described, *Ophiomeris Macahensis* and *O. Iquasuensis*, both from the province of Rio de Janeiro.

‘On *Jansonia*, a new Genus of *Leguminosæ* from Western Australia. By Mr. Richard Kippist, Libr. L.S., &c., &c.’

The species is called *Jansonia formosa*.

‘On the Structure of the *Ascidia* and *Stomata* of *Dischidia Rafflesiana*, *Wall.* By the late William Griffiths, Esq., F.L.S., &c. Communicated by R. H. Solly, Esq., F.R.S., F.L.S., &c.’

‘On the Impregnation of *Dischidia*. By the late William Griffiths, Esq., F.L.S., &c., &c. Communicated by R. Brown, Esq., V.P.L.S., &c., &c.’

‘On *Athalamia*, a new Genus of *Marchantieæ*. By Hugh Falconer, Esq., M.D., F.R.S., F.L.S., Superintendent of the Hon. East India Company’s Botanic Garden at Calcutta, &c., &c.’

The species described is called *Athalamia pinguis*. I do not observe any notice of its habitat.

‘On the Early Stages of *Lemanea fluviatilis*, *Agardh*. By G. H. K. Thwaites, Esq., Lecturer on Botany and Vegetable Physiology at the Bristol Medical School. Communicated by the Rev. M. J. Berkeley, F.L.S.’

‘On *Meliantheæ*, a new Natural Order, proposed and defined by J. E. Planchon, Docteur-es-Sciences. Communicated by the Secretary.’

‘Some Account of an undescribed Fossil Fruit. By Robert Brown, Esq., D.C.L., F.R.S., V.P.L.S.’

The paper by the late Mr. Griffiths on *Dischidia Rafflesiana* will be found highly interesting to physiological botanists, although I think many of these will hesitate to accept the learned author’s conclusion. The following interesting passage is worthy of a careful perusal:—

“This curious plant occurs abundantly about Mergui, and affects old and partially decayed trees. I have hence been able to examine abundance of specimens loaded with ascidia of different degrees of development. I offer the observations relating to these curious appendages, as I conceive they throw light on their nature, which, if analogy holds good, appears to have been generally misunderstood. The commonly adopted opinion, and that which Dr. Lindley advocates in his ‘*Outlines of the First Principles of Botany*,’ and in his ‘*Introduction to the Natural Orders*,’ is, that the pitcher is a modification of the petiole, and the lid, or operculum, of the lamina. The structure of *Dionæa* certainly seems in favour of this opinion. Mr. Brown, in his ‘*Remarks on the Structure and Affinities of Cephalotus*’ (Lond. and Edinb. Phil. Mag. Oct. 1832), says, that ascidia in all cases are manifestly formed from the leaves, but does not refer the pitcher or lamina to any particular part of the leaf.

“The ascidia of this species have, as might be expected, the same arrangement as the leaves; they are opposite and shortly pedicellate. They are however crowded together, while the leaves are distant. In shape they are oblong-ovate, somewhat compressed, with a few elevations and depressions, which correspond to those formed in the leaves by the nervures. They are open at the base, the margins being rounded off, owing to their being inflected into the pitcher in the shape of a linguiform process. Immediately below the base they are slightly constricted. The opening is invariably directed upwards. Their colour externally is that of the leaves,—a dingy yellowish green, often inclining to glaucous. Internally they are of a rich dark purple, studded with innumerable and very minute white spots.

“The colour of the inflected portion internally is much lighter than that of the corresponding surface of the leaf: its outer surface is of a light purplish brown. They appear at no period to contain fluids, but invariably contain one or more branched roots, which, taking their origin from various parts of the petiole, pass down through the opening. These roots are always more succulent and of a lighter colour than those formed in any other part. Their structure is precisely that of the limb of the leaves; the only difference being in form and in the colour of the inner surface, which corresponds to the concave of the leaves.* This structure presents nothing peculiar with the exception of the stomata. The proofs I have to give of their being modified laminæ are:—

“1. Their similarity in texture and internal structure, and that of the stomata with those of the limb of the leaves.

“2. There is a constant and appreciable though slight tendency in the limb of the leaves to assume an involute form, their margins and apex being always, and especially in old leaves, more or less incurved.

“3. The occurrence of an imperfectly transformed pitcher, in which the body of the pitcher is clearly referrible to the limb of the leaf. The petiole has retained its usual form. This specimen resembled closely the bottom of a perfect pitcher, being, however, much less compressed: it was completely open at the top, no constriction having taken place. The margins and apex were slightly incurved: there was a slight tendency towards coloration, but only towards the fundus.

“4. In this family at least it is more natural to refer the ascidia to the limb from the general construction of their petioles.

“If we can extend the analogy drawn from the structure of the ascidia of this plant to the other cases of their formation, in *Nepenthes*, *Cephalotus* and *Sarracenia*, in which the development is much more perfect, we shall have a petiole of ordinary form and a curiously modified limb, the lamina being an appendage of the limb. I consider the inflected portion of the pitchers of *Dischidia* as analogous to the movable opercula of the more perfect examples cited above, although in this it is continuous with the body of the pitcher. Mr. Brown however says (*loc. cit.*), that the ascidia of *Dischidia* have no laminæ. I may add, that petioles are much less liable to modifications than laminæ.

“* The leaves are smooth and somewhat concave on one surface, convex and rugose on the other; but the whole growth is so straggling, that it is difficult to say which is the upper and which the under surface. I think that the inner surface of the pitcher corresponds to the upper of the leaves, that being the smooth concave surface.”

If the pitchers of *Nepenthes*, &c. are modified petioles, the cucullate bractæ of *Marcgraviaceæ* will be referrible to the petiole of the bractæ."

As I am now giving, in a connected form, the authorized abstracts, admirably prepared by the Secretary, of all botanical papers read before the Linnean Society, and as these abstracts of course appear much earlier than any I could make from the papers when published in the Transactions, I think it will be obvious that in this place I can do little more than give the titles of the papers, in the mere catalogue form adopted above. I cannot conclude this brief notice of a valuable publication without expressing my sincere and fervent hope that the task of recording the publication of these Transactions will in future devolve on me more frequently.

Notice of the 'Botanical Gazette,' No. 31, July, 1851.

The papers in this number are intituled :—

'Biographical Notice of the late Mr. George Don, of Forfar. By Pat. Neill, LL.D. Read to a meeting of the Botanical Society of Edinburgh held on May 15.'

Mr. Don died in January, 1814. The length of time since that date would surely have allowed the compilation of a more ample memoir than the present memorandum, which contains little new as to the biography of this remarkable self-taught man.

'On Ceratomania in general, and more particularly on the Abnormal Spores of the Perianth. By M. Ch. Morren. Abstract from the Memoirs of the Belgian Academy, Vol. xvi. 1849.'

'Literature :—Under this head the following works are noticed :—
'Transactions of the Linnean Society of London, Vol. xx. Part III. 1851.' 'Species Filicum;' being descriptions of all known Ferns. Illustrated with Plates. By Sir W. J. Hooker, K.H., LL.D., &c. Part V., or Vol. ii. Part I.' 'The Microscope and its Use, especially in Vegetable Anatomy and Physiology. By Hermann Schacht. Berlin, 1831. 8vo., pp. 198 and 6 plates.' The reviewer strongly recommends this work; he says, "It clearly explains all the details of the processes of investigation, both with the single and compound microscopes, and from the many practical hints it contains, it will be useful not only to beginners but to experienced microscopists." 'Annals of

Natural History,' June, 1851. 'Hooker's Journal of Botany,' June, 1851. 'The Phytologist,' June, 1851. 'Botanische Zeitung,' 1850. 'The Flora,' 1850.

'Proceedings of Societies :—Botanical Society of Edinburgh. Botanical Society of London.

'Miscellanea :—'Botanical Memoranda, by W. Borrer, Esq.' In this paper Mr. Borrer corrects certain errors of habitats reported last year in the Gazette and other works. *Euphorbia pilosa* and *Veronica verna*, said to grow wild near Battle and Hastings, were found to be *E. platyphylla* and *V. arvensis*. Of the fact no doubt exists, since the gentleman who reported these stations accompanied Mr. Borrer to the spots where the supposed rarities were growing. In Horsfield's 'History of Sussex,' *Cuscuta Europæa* is reported, on Mr. Borrer's authority, as growing abundantly on furze in Thorney Island, and occasionally in fields of vetches. The plant on furze is *C. Epithymum*; that on vetches is what is now called *C. Trifolii*. "*Eriophorum gracile*, 'Bot. of Sussex,' is the slender state of *E. polystachion*, the *E. gracile* of Smith, not of Koch." Mr. Borrer considers the Matlock *Thlaspi*, given in Eng. Bot. as *alpestre*, to be the *T. virens* of Jordan, as suggested by Mr. Babington.

Notice of the 'Annals and Magazine of Natural History,' No. 43, July, 1851.

The only botanical paper, intituled 'Some Remarks on Mosses, with a proposed new Arrangement of the Genera, by William Mitten, A.L.S.,' is one of great interest. Without attempting to express any opinion as to the value of the new combinations here introduced, it cannot be questioned that they are the result of much study, and are therefore to be commended to the careful and attentive perusal of all bryologists.

"It was in 1847," says Mr. Mitten, "whilst examining *Phascum multicapsulare* of Smith, that the author's attention was first arrested by the fact that all the *Cleistocarpous* mosses might be distributed among the *Stegocarpous* genera; since which the subject has been neglected, and he now publishes his ideas from seeing in the most recent works on bryology the continued adhesion to the old plan of keeping up a class of *Cleistocarpous* genera and species."

The author regards the Musci as neither agamous nor cryptogamous, but as the highest order of acotyledons, "forming the next link to monocotyledons," and as taking "precedence of the Filices, Lycopodia and Equiseta, in which inflorescence is unknown." He thus defines the Musci:—

"Plants with stems bearing horizontal leaves, which are mostly composed of one layer of cells, and furnished with thickened nerves. Inflorescence surrounded by proper involucreal leaves. Male flowers composed of anthers, *antheridia*; female, of pistils, *archegonia*, which, as well as the antheridia, are mixed with slender threads, *paraphyses*. Fruit an unilocular capsule, bursting at the sides or operculate, surmounted by a calyptra."

After explaining the inflorescence, and especially the character of the capsule, as either being without a regular opening and bursting at the sides (astomate), or furnished with an operculum, which, being removed, leaves the capsule closed by a membrane (stomate), and also the mouth of the capsule as naked (gymnostomate), with hygroscopic teeth (peristomate), or with the sporular sac also divided above into processes and cilia (diploperistomate); he goes on to observe that "in some well-marked genera, as *Encalypta*, *Orthotrichum* and *Zygodon*, there exist gymnostomate, peristomate and diploperistomate species, too closely allied in all other respects to be separated generically in any natural arrangement. In *Weissia*, including as of one genus, *Astomum Mittenii*, *Phascum crispum*, *P. rostellatum*, and all the *Hymenostoma*, *Gymnostoma*, and *Weissia* of 'Bryologia Europæa,' are seen species astomate, stomate, gymnostomate and peristomate; and most of these mosses without the presence of fruit would be difficult enough to distinguish as species, to say nothing of genera;—from which the conclusion seems evident, that as a more or less perfect series of progressive developments from astomate to diploperistomate capsules may occur in a single genus, so any degree of development less perfect than the diploperistomate may be considered but an imperfect state of that degree, and of no importance in generic distinctions whenever it is possible to trace a higher."

In the arrangement founded on these views, M. C. Müller's plan of dividing the genera into groups by the form of the cells of the leaves is adopted with some modifications. The following is a skeleton of the arrangement:—

Tribe I. ANDREÆACEÆ.

Genus.—*Andreæa*, *Ehrh.*

Tribe II. DICRANACEÆ.

Sect. 1. *Leptotrichoideæ*.—Leaves without enlarged cells at the base.

Genera.—*Archidium*, *Brid.*; *Bruchia*, *Schw.*; *Angstrœmia*, *B. & S.*; *Trematodon*, *Rich.*; *Brachyodus*, *Furnr.*; *Campylostelium*, *B. & S.*; *Seligeria*, *B. & S.*; *Symblepharis*, *Mont.*; *Leptotrichum*, *Hampe*; *Distichium*, *B. & S.*; *Eustichia*, *Brid.*; *Drepanophyllum*, *Rich.*

Sect. 2. *Dicranoideæ*.—Leaves with enlarged and mostly coloured cells at the base.

Genera.—*Blindia*, *B. & S.*; *Eucamptodon*, *Mont.*; *Holomitrium*, *Brid.*; *Dicnemon*, *Schw.*; *Pilopogon*, *Brid.*; *Dicranum*, *Hedw.*

Tribe III. POTTIACEÆ.

Sect. 1. *Trichostomoideæ*.—Peristome of narrow slender teeth.

Genera.—*Schistidium*, *Brid.*; ? *Gonomitrium*, *Hook. et Wils.*; *Pottia*, *Ehrh.*; *Trichostomum*, *Hedw.*; *Barbula*, *Hedw.*; *Streptopogon*, *Wils.*; *Ceratodon*, *Brid.*; *Weissia*, *Hedw.*; *Syrrophodon*, *Schw.*; *Calymperes*, *Sw.*; *Tridontium*, *Hook. fil.*

Sect. 2. *Zygodontoideæ*.—Peristome of broad teeth.

Genera.—*Coscinodon*, *Spreng.*; *Glyphomitrium*, *Brid.*; *Brachystelium*, *Richb.*; *Gumbelia*, *Hampe*; *Grimmia*, *Ehrh.*; *Cryptocarpus*, *Dzy. et Molk.*; *Drummondia*, *Hook.*; *Zygodon*, *Hook. et Tayl.*; *Orthotrichum*, *Hedw.*; *Macromitrium*, *Brid.*; *Schlotheimia*, *Brid.*; *Encalypta*, *Schreb.*

Tribe IV. FUNARIACEÆ.

Sect. 1. *Funaroideæ*.—Capsules not remarkably apophysate. Peristome of trabeculate teeth.

Genera.—*Ephemerum*, *Hampe*; *Ephemerella*, *C. Müller*; *Physcomitrium*, *Brid.*; *Pyramidium*, *Brid.*; *Entosthodon*, *Schw.*; *Disceium*, *Brid.*; *Funaria*, *Schreb.*; *Amblyodon*, *Pal. de Beauv.*

Sect. 2. *Splachnoideæ*.—Capsules sometimes remarkably apophysate. Peristome of mostly geminate teeth, which are not trabeculate.

Genera.—*Ædipodium*, *Schw.*; *Tetraplodon*, *B. et S.*; *Tayloria*, *Hook.*; *Dissodon*, *Grev. et Arnott*; *Splachnum*, *Linn.*

Tribe V. BRYACEÆ.

Genera.—Schistostega, *Mohr.*; Meilichhoferia, *Hsch.*; Leptochlæna, *Mont.*; Orthodontium, *Schw.*; Bryum, *Dill.*

Tribe VI. BARTRAMIACEÆ.

Genera.—Oreas, *Brid.*; Catoscopium, *Brid.*; Plagiopus, *Brid.*; Meesia, *Hedw.*; Paludella, *Ehrh.*; Conostomum, *Sw.*; Bartramia, *Hedw.*

Tribe VII. MNIACEÆ.

Genera.—Hymenodon, *Hook. et Wils.*; Fissidens, *Hedw.*; Octodiceras, *Brid.*; Mniadelphus, *C. Müller*; Daltonia, *Hook. et Tayl.*; Cinclidotus, *Pal. de Beauv.*; Scouleria, *Hook.*; Georgia, *Ehrh.*; Leptostomum, *R. Brown*; Leptotheca, *Schw.*; Timmia, *Hedw.*; Mnium, *Dill.*

Tribe VIII. HYOPTERYGIACEÆ.

Genera.—Hypopterygium, *Brid.*; Cyathophorum, *Pal. de Beauv.*; ? Helicophyllum, *Brid.*

Tribe IX. HYPNACEÆ.

Genera.—Rhegmato don, *Brid.*; Fabronia, *Raddi*; Neckera, *Hedw.*; Aulacopilum, *Wils.*; ? Wardia, *Harvey*; Phyllogonium, *Brid.*; Pilotrichum, *Pal. de Beauv.*; Hookeria, *Smith*; Hypnum, *Dill.*

Tribe X. POLYTRICHACEÆ.

Genera.—Lyellia, *R. Brown*; Polytrichum, *Dill.*; Dawsonia, *R. Brown.*

Tribe XI. BUXBAUMIACEÆ.

Genera.—Diphyscium, *Web. et Mohr.*; Buxbaumia, *Haller.*

Tribe XII. LEUCOBRYACEÆ.

Genera.—Octoblepharum, *Hedw.*; Arthrocor mus, *Dzy. et Molk.*; Leucophanes, *Brid.*; Schistomitrium, *Dzy. et Molk.*; Leucobryum, *Hampe.*

Tribe XIII. SPHAGNACEÆ.

Genus.—Sphagnum, *Dill.*

Notice of 'The Naturalist,' No. 5, July, 1851.

The only botanical paper is a continuation of 'Notes on a Botanical Stroll from Plymouth to Bickleigh Vale, going and returning by different routes; by Isaiah W. N. Keys.' It contains nothing on which I can offer a comment.

Notice of Hooker's 'Journal of Botany and Kew Garden Miscellany,' No. 31, July, 1851.

The communications to this number are intituled :—

'Second Report on Mr. Spruce's Collections of Dried Plants from North Brazil; by George Bentham, Esq. Continued.'

'Decades of Fungi; by the Rev. M. J. Berkeley, M.A., F.L.S. Decade xxxvi. Sikkim-Himalayan Fungi, collected by Dr. Hooker.'

'Contributions to the Botany of Western India; by N. A. Dalzell, Esq., M.A. Continued.'

'Letter from Dr. Andrew Sinclair on the Vegetation, &c., of the Neighbourhood of Auckland, New Zealand.'

'A Letter from Dr. De Vriese to Robert Brown, Esq., on a new Species of *Rafflesia* in the Island of Java, discovered by MM. J. E. Teyssman and S. Binnendijk.'

'Extract from a Letter of the Rev. W. Colenso, relating to a second Species of New Zealand Flax—*Phormium*.'

Mr. Bentham's paper contains descriptions of eleven species, all of the order Sapindaceæ; these are—*Serjania nitidula*, *S. platycarpa* and *S. hebecarpa*, *Paullinia spicata*, *P. interrupta*, *P. pachycarpa*, *Schmidelia leptostachya*, *Sapindus cerasinus*, *S. oblongus*, *Cupania geminata*, *C. Spruceana* and *C. frondosa*.

Mr. Dalzell describes twelve new species from Western India—*Guatteria fragrans*, *Unona pannosa*, *Sageræa laurina*, of the order Anonaceæ; *Smithia capitata*, *S. setulosa*, *Galictia simplicifolia*, *Phaseolus pauciflorus*, *Crotalaria epunctata*, *Glycine Warrensis*, and *Alysicarpus parviflorus*, of the order Leguminosæ; *Ophelia pauciflora*, of the order Gentianeæ; and *Pimpinella monoica*, of the order Umbelliferae. The genus *Sagaræa* of Dalzell, of the tribe Bocageæ, is characterized for the first time.

The following extract from Dr. Sinclair's letter is interesting :—

“The most interesting spot for a botanist near Auckland is the Manukau forest, about eight miles off in a straight line. In it are found nearly all the timber trees of the colony, and amongst them, the most imposing in appearance is the Kauri. It is, however, not so large here as in the forest on the banks of the Kaipuru, the Hookianga, and at other places farther north, The Manukau forest may be called the present limit of the tree on that side of the island, there being very few examples of it farther south, and these very small, although from the quantities of the gum to be met with in the soil a great distance beyond, it must have grown abundantly there in former times. The quantity of Kauri timber in the forest which stretches from Manukau harbour to the heads of the Wairoa and Kaipuru appears inexhaustible, and a great portion of it is not of difficult access. It is only, however, on the banks of the latter rivers that spars of sufficient size for the Royal Navy can be found. Though the cutting of the timber has gone on since the establishment of the colony, little impression has been made on the forest, and in places where surveyors have been at work for years, their labours have rarely extended a gun-shot from their houses. Besides the Kauri, the other trees felled were chiefly the Pohutukana and Rata (*Metrosideros tomentosa* and *robusta*) ; the Puriri (*Vitex litoralis*), for ship-timbers and other purposes requiring great durability and strength. The number of Kauri trees must be diminishing, for in many places, where the felling of timber has been carried on, there are no young trees rising up to supply the place of others decayed from age, or cut for removal ; but that is not the case in that part of the Manukau forest nearest Auckland, where the young trees of all sizes are very numerous.

“Though the Kauri does not grow to such a large size in the Manukau forest as in others farther north, vegetation is exceedingly vigorous, and it presents an inexhaustible field of interest to the botanist. The trunks of the old trees are clothed and festooned with *Astelias*, climbing *Metrosideros*, *Orchidaceæ*, ferns, mosses and *Jungermannia*, in the greatest profusion. The deep hollows within the forest are penetrated with difficulty, from the interlaced stems of the *Ripogonum* and other under-shrubs. In the deep sheltered parts of the forest, some plants are found of extraordinary size, and amongst them I have measured the *Areca sapida* thirty-six feet high, and the *Cyathea dealbata* attaining a height of fifty-four feet. It is along the margin of the forest, however, and up the abrupt winding ravines, and at the sawing stations, where the falling of lofty trees brings down

masses of vegetation generally beyond reach, that botanizing is pursued with most success."

The new species of *Phormium*, which forms the subject of the Rev. W. Colenso's paper, was previously mentioned as new by M. Auguste le Jolis, *Lond. Journ. of Bot.* vii. 533, under the title 'On a new kind of *Phormium*,' and still anterior to this by the Rev. gentleman himself, in a letter to Sir W. Hooker, under date of July 20, 1841, an extract of which was published in the same journal (i. 305). It has received in succession the three names of *Phormium Fosterianum*, *P. Colensoi* and *P. Cookianum*.

Anacharis Alsinastrum, Bab. [*Udora Canadensis*], in *Warwickshire, with Remarks on its Nativity in this Country*. By THOMAS KIRK, Esq.

CHIEFLY for the information of neighbouring botanists, I communicate the fact of the occurrence of this interesting plant, in the greatest abundance, in the greater portion of an unused loop branch of the Oxford Canal, between Wyken Colliery and Sow Waste, amongst miniature submerged meadows of *Potamogeton zosteræfolius* and its allies. About Christmas last, I observed it in great quantity in the canal, nearly opposite Brownsover Chapel, near Rugby. In the first-mentioned locality it is now plentifully but not generally in flower: its maximum will be attained by the end of August, but I gathered specimens in flower early in the month of June. It occurs at various depths below the surface, and, contrary to what I have elsewhere noticed, many flowers are expanded under the surface of the water. Many of the flower-stalks are from six to ten inches in length. It is rather curious that when hunting for water plants, I have frequently been within a dozen yards of the point where the *Anacharis* commences, but never till the present season have I been close enough to see it.

After such weighty authority has expressed so positive an opinion of its exotic origin, it requires some courage to put in a plea for its nativity, but in my mind there is no doubt on the subject. I have shown in a former article (*Phytol.* iii. 989) that it has been known for upwards of twenty years in a locality visited by botanists, and yet overlooked by them. Even supposing the plant introduced at Dunse-Castle Loch, and accidentally transferred to the Whiteadder from thence, neither of which suppositions I consider at all proved, how is

it that we find it established in the counties of Edinburgh, Stafford, Nottingham, Leicester, Northampton, and Warwick (to say nothing of Hants and Dublin, in which last locality, by the by, it is quite as likely to have been introduced, if introduced it be, with undoubted British aquatic plants as with exotics), without any botanist having noticed it during its migrations? Why, because it has only been recently noticed, must it be "introduced?" A few years ago, *Potamogeton zosteræfolius*, by no means an inconspicuous plant, was only known certainly to exist in four counties; that number may now be trebled at least, and in one or two counties, as Warwick, it is quite a common plant. As well might we assert that its more recently discovered habitats were supplied from the earlier, and hint the probability of its being only naturalized in them. I see nothing more improbable in one case than the other. There are few botanists but may call to mind instances of some well-known plant existing in their own neighbourhood unknown to them, till some accidental circumstance has forced it upon their notice, and caused them to wonder that the plant for which, mayhap, they have diligently searched, could have been all the time under their noses without their once having observed it; yet they would hardly consider the plant introduced in that particular locality, merely because it had for so long a time eluded their notice. Why, then, because it is a new plant, must the *Anacharis* be stigmatized as "introduced?" It is not the only recent addition to the British flora that has existed for years under the eyes of our most "lynx-eyed" botanists unrecognized and unknown. Why not call the *Leersia* "introduced?"

The *Anacharis* is a plant so often intermingled with and hidden by other aquatic plants of a more robust habit of growth, that a keen observer may very readily be excused for passing it unnoticed. Then consider the greater amount of attention bestowed of late years on the "uninviting genus *Potamogeton*" and water plants in general, as evidenced by our increased amount of information as regards their distribution, and I think we shall cease to wonder at the "sudden diffusion of the *Anacharis*," and merely observe that an increased amount of observation amongst water plants in general has been proportionately rewarded by the addition, in many localities, of a new species to our flora.

THOMAS KIRK.

Coventry, July 26, 1851.

Grammitis Ceterach growing in a Tree, and some other Hampshire Localities for Ferns not mentioned by Dr. Bromfield. By R. W. SMITH, Esq.

Grammitis Ceterach growing on a Tree.—Being an amateur and occasional collector of our indigenous ferns, I am induced to record the occurrence of what appears to me a most interesting group of these plants on an old tree at Pitt, in this neighbourhood, but not within half a mile of any house. The gnarled roots of the tree overhang a very ancient and deep chalk lane adjoining the Roman road to Salisbury, and on these I found *Asplenium Adiantum-nigrum*, *A. Trichomanes*, and several plants of *Grammitis Ceterach*. I removed some of each species, and they are now all growing together in my garden, but you may be sure I did not destroy the locality. I do not find any previous record of *Grammitis Ceterach* growing on a tree as an original habitat, and the whole group together is most interesting.

Hampshire Localities for Ferns not mentioned by Dr. Bromfield.—

Lastrea Thelypteris. Grows in one small spot near this town. I see Dr. Bromfield has only noticed it at Freshwater, Isle of Wight.

Botrychium Lunaria. I found it this year growing in meadows near the springs of the Itchen, at Titchbourne and Hinton.

Lycopodium inundatum. At St. Jermyn's, near Romsey.

Pilularia globulifera. At Badderley.

R. W. SMITH.

Winchester, July 11, 1851.

Abnormal Form of Lolium perenne, and Occurrence of Anacharis Alsinastrum at Cambridge. By the Rev. W. M. HIND, M.A.

Abnormal Form of Lolium perenne.—I have the pleasure of forwarding specimens of *Lolium perenne*, *L.*, considerably changed in growth from the normal state of the plant. The chief variations are :—culm geniculate ; spikelets, except the lowest one, crowded, divergent, and without glumes ; the lowest spikelet is invariably as in the ordinary state of the plant, distant, appressed, and with a glume ; the next spikelet has most generally a glume, but not always ; the spike-

lets are sometimes so crowded near the top of the rachis as to give the spike somewhat of a compound appearance. I have found a small patch of the plant in this neighbourhood covering two or three square feet of ground. It grows close to a footpath, and the constant trampling on the ground may have affected the growth of the plant, and caused it to sport.

Occurrence of Anacharis Alsinastrum at Cambridge.—I may mention, for the information of your readers, that I found *Anacharis Alsinastrum*, *Bab.*, last Thursday at Cambridge, in a ditch near the railway-station, and adjoining the road to the Fitzwilliam Museum. This plant now occupies a much larger portion of the river here (the Trent) than when first noticed, about eighteen months back; in fact, it bids fair, in a very short time, to block up one of the two streams into which the Trent here divides. As regards the Cambridge locality for this plant, it may be desirable to inquire whether it has been introduced by any of the botanists of that neighbourhood.

W. M. HIND.

Burton-on-Trent, July 26, 1851.

Botanical Society of Edinburgh.

Thursday, July 10, 1851.—Professor Dickie was elected Local Secretary for Belfast; Professor Hincks, for Cork; and Professor Melville, for Galway.

The following donations were announced:—‘*De la Teratologie Végétale*, par Charles Martins,’ from the Author; ‘*Observations sur la Floraison de quelques Plantes cultivées faites à Moscou*, par N. Annenkow,’ from the Author; ‘*Flora of Liverpool*,’ from the Author; British plants from Mr. G. Lawson.

Dr. Balfour exhibited a specimen of a species of *Polyporus* from America, which had been presented to the museum at the Garden by Dr. Knapp; bark of *Quillaia saponaria* from Guyana, presented by Professor Traill; and specimens of *Sphæria polymorpha* from Dr. Greville. Dr. B. also announced a donation of valuable seeds to the Botanic Garden, from Ch. A. Meyer, of the Imperial Garden of St. Petersburg.

Dr. Balfour exhibited specimens of the following monstrosities:—

1. An *Arum* with a double spathe, the second spathe being alter-

nate with the first. The spadix at the lower end showed the appearance of the adhesion of a second spadix. This specimen was from the garden of Dr. Neill, Cannonmills Cottage.

2. A monstrosity of *Antirrhinum majus*, presenting a regular flower formed by five personate petals with gibbous bases.

3. Monstrosity of white *Digitalis*, showing the terminal floret composed of several united, and expanding before the other flowers in the raceme. There was thus a mixed inflorescence, partly definite and partly indefinite.

A letter was read from Mr. Wyville Thomson, Lecturer on Botany, King's College, Aberdeen, in which he states:—"A few days ago, walking along Dee-side, about seven miles above Aberdeen, I was much surprised to see *Prunus spinosa* (common sloe) covered with large handsome fruit, of a bright red colour, and a pod very like the capsicum. The sloe-trees grow along the river-side, and are of that half-cultivated variety which attains the height of twenty or thirty feet, is straight and wants spines. The trees were closely tangled along the river-side for the distance of about a hundred yards, all covered with this strange monstrosity. On examining the pods a little more closely, they proved to be carpels disdaining their usual tardy progress into a drupe, and hurrying into a pseudo-legume. On cutting them open, they exposed usually one, sometimes two, abortive ovules, attached to a sutural placenta. This was odd enough; but imagine my surprise when I came to several trees of *Prunus Padus*, a little farther on, covered with long clusters of bright green unripe pods of a similar kind. We well know that the Rosaceæ are very prone to eccentricity with regard to their carpels, and to see one tree in that condition would not surprise me, but why all the individuals of *Prunus spinosa* in that neighbourhood should have gone wrong, and especially why the other species should have joined them, I am at a loss to conjecture." Specimens of the monstrosities in both species were exhibited, and were presented to the museum at the Botanic Garden.

Dr. Balfour suggested that these teratological appearances might be caused by the attacks of insects, and that they pointed out the connexion between Rosaceæ and Leguminosæ, two orders which are chiefly distinguished by the position of the odd sepal.

The following paper was read:—

'Some Remarks on the Plant, Morphologically considered; by the Rev. Dr. M'Cosh, Brechin.' "According to the common idea, the plant is composed of two essentially distinct parts—the stem and

the leaf. The axis of the embryo proceeds downward and upward simultaneously, the descending axis being the root, and the ascending one the stem or trunk. Upon these axes others are formed as subterranean or aërial branches. The leaf is formed upon the ascending axis, and besides its common form, it assumes, while obeying the same fundamental laws, certain other forms, as in the sepals, the petals, the stamens and pistils. Schleiden, in 'The Plant, a Biography,' gives us a picture of a typical plant constructed on this principle. This makes a plant a dual, or composed of two essentially different parts.

"But to us it appears possible to reduce a plant, by a more enlarged conception of its nature, to a unity. According to our idea, it consists essentially of a stem sending out other stems similar to itself, at certain angles, and in such a regular manner that the whole is made to take a pre-determined form. The ascending axis, for instance, sends out, at particular normal angles in each tree, branches similar in structure to itself. These lateral branches again send out branchlets of a like nature with themselves, and at much the same angles. The whole tree, with its branches, thus comes to be of the same general form as every individual branch, and every branch, with its branchlets, comes to be a type of the whole plant in its skeleton and outline.

"Taking this idea of a plant along with us, let us now inquire whether there may not be a morphological analogy between the stems and the ribs or veins of the leaf. As these veins are vascular bundles, proceeding from the fibro-vascular bundles of the stem, they may be found to obey the same laws. Physiological confirmations of this presumption may be found in the following circumstances:—1st. Both stem and vein are capable of becoming a spine, the stem as in the thorn, the vein as in the thistle. 2nd. It is also an unsettled question whether the inflorescence and seed-vessels, in many cases, are formed out of metamorphosed leaves or metamorphosed branches. The very fact that there is such a dispute shows that there is an analogy between leaf and branch. 3rd. The vein of the leaf is capable equally with the stem of producing a leaf-bud, as in *Bryophyllum* and *Gloxinia*.

"We begin with the examination of those plants which have a fully-veined or reticulated leaf, and here we shall find a morphological analogy between the leaf and the branch, and the leaf and the whole plant. We are quite aware that in respect of physiological development there is a wide difference between the two, but this will

just render the morphological resemblance, if it exists, the more curious and striking. It should be noticed that this resemblance can be observed only when both the stems and the veins are fully and fairly developed.

“In prosecuting this inquiry, let us first inspect, in a general way, the leaf of a tree, with its central vein or veins, and its side veins. Even on the most careless inspection, the central vein will be found to bear a striking analogy to the central stem or axis of the tree, and the side veins to the branches. Having viewed the leaf in the first instance, let us then look at the tree when stripped of its leaves in winter, and we shall see how like it is in its contour and skeleton to the contour and skeleton of a leaf. We shall be particularly struck with this if we view it in the dim twilight or the ‘pale moonlight’ between us and a clear sky. In both leaf and tree we see a central stem or stems with ramified appendages going off at certain angles; and we may observe that the tree in its outline tends to assume the form of a leaf.

“The general impression produced by a first glance will be confirmed on further inspection. The analogy between the skeleton of the leaf and the skeleton of the branch may be seen in a number of points, as well as in the general resemblance between the ramification of the plant and the ramification of the venation of the leaf. 1st. Some trees, such as the beech, the elm, the oak, the holly, the Portugal and bay laurels, the privet, the box, will be found to send out side branches along the axis from the root, or near the very root, and the leaves of those trees have little or no petiole or leaf-stalk, but begin to expand from nearly the very place where the leaf springs from the stem. There are other trees, as the common sycamore (the Scotch plane-tree), the beech, the chestnut, the pear, the cherry, the apple, which have a considerably long unbranched trunk, and the leaves of these trees will be found to have a pretty long leaf-stalk. 2nd. Most of our low, branching, herbaceous plants, such as the mallows, rhubarb, Tussilago, marsh marigold, lady’s mantle, hollyhocks, send out a considerable number of stems from near the root, and it will be found in exact accordance with this, that these set off from the base of the leaf a considerable number of main veins or ribs, which as they spread cause the leaf to assume a rounded shape. In these plants, the morphological resemblance between tree and plant is seen *horizontally*, and not *vertically*. In this respect these plants are different from our forest trees, which send up commonly one main axis with lateral branches, and have in their venation one leading

vein with side veins. 3rd. Some trees, such as the beech, the birch, the elm, send up one large main stem, from which, throughout its length, there proceed comparatively small branches pretty equally along the axis, and it will be found in such cases that the leaf has a central vein, with pretty equally disposed veins on either side. Other trees, again, tend rather to send off, at particular heights, a number of comparatively thick branches at once. This is the case, for instance, with the common sycamore, the chestnut, and the laburnum. The trunk of the sycamore (*Acer Pseudo-platanus*), about eight or ten feet above the surface of the ground, commonly divides itself into four or five large branches, and in precise analogy we find the leaf at the top of a pretty long leaf-stalk sending off four or five large veins. The chestnut tends to send off at the top of the unbranched trunk a still greater number of branches, and we find in correspondence with this that its leaf is commonly divided into seven leaflets. The laburnum (and also the broom and clover) goes off in triplets in respect of leaflet and ramification. In such cases it will commonly be found that the leaf is compound, and we are to *regard all such compound leaves as one, and representative of the whole tree*. Generally it is the whole leafage coming off at a given place, which represents the whole tree; and the single leaf, when there is a number of leaves, represents merely the branch. 4th. Some plants, such as the Rhododendron, the Azalea, and the lupin, send off leaves which have a tendency to become whorled, and their branches have also a tendency to become verticillate. 5th. The stems of some trees, such as the thorn and laburnum, are not straight, and the branches have a twisted form; and it will be found that the vein of the leaf of these trees is not straight, and that the leafage is not in one plane. This is also seen in the elm. 6th. In some trees, such as the beech, the stems go off in nearly straight lines, and the leaves are found to have a straight venation. In other trees, again, such as the chestnut, the branches have a graceful curve, and the veins of the leaves are curved in much the same way. 7th. In most plants the angle at which the side stems go off will be found to widen as we ascend to the middle, and thence to decrease as we ascend to the apex, and the venation of the leaves will be found to obey a similar law. This helps to give both to tree and leaf their beautiful oval outline. In some plants, again, such as the poplar and birch, the angles are widest at the base, and tend to narrow as we ascend, and both leaf and tree in such cases assume a kind of triangular form. 8th. Generally we shall find a correspondence between

the angle of the ramification of the tree and the angle of venation of the leaf. The following table gives the results of numerous measurements of the angles of branching and venation, where these were found to agree :—

	deg.		deg.
Beech	45	Rose	50
Plane-tree	45	Laburnum (small branches) . .	60
Birch	40	Box (over)	60
Oak, 50 (large branches, 65—70, same venation)		Thistle	60—70
Cherry	50	Thorn (lowest branches) . .	35—50
Portugal laurel	50—60	Ash	60
Bay laurel	50—60	Elm	45—50
Holly	55—60	Bird cherry	60
Rhododendron	60	Red dog-wood	45
Lime	40—45	Alder	50

We have made a sufficient number of measurements to be able to say that there is often such a correspondence. But it should be acknowledged, that while it is not difficult to determine the angle of the venation of the leaf, it is most difficult to determine what is the normal ramification of the tree, for the angle at which the branch goes off is liable to be modified by a great number of circumstances. All that we argue for is a general correspondence between the tendency of the direction of the branches and the tendency of the direction of the veins of the leafage,—a tendency liable, however, to be affected by a great number of circumstances, natural and artificial. It does not follow, because there is a correspondence between the venation of the leaf and the ramification of the tree, that therefore the two—the leaf and tree—must have the same form. The form of the leaf will be to some extent modified by the quantity of parenchyma, and the form of the tree by the weight of the branches; and there are other causes producing a discrepancy. But the two—the leaf and tree—will commonly assume the same form. Even when they differ, the correspondence will be seen in the *tendency*, apart from extraneous causes, to take the same form. *It is always to be remembered that it is the whole leafage coming out at a given place which represents the tree, and the single leaf, where there are more leaves than one, represents the branch or the young tree.* It is only thus that I can bring the ash and mountain-ash into accordance with these views. The whole leafage, with its stalk, represents the tree, and the leaf-branch and leaflet, the branches and branchlets, as also the young tree.

“ Such facts as these strongly incline us to the belief that in plants

with leaves that strike the eye, the leaf and plant are typically analogous. The leaf is a typical plant or branch, and every tree or branch is a typical leaf. I am quite aware of the differences between these two distinct members of the plant. In particular, we find in the case of the full tree that the branches extend all round the axis, whereas in the leaf the fibrous veins all lie in one plane. But then we have a phenomenon to connect these two in the branch, the branchlets of which often lie in one plane. The principal difference between the tree and leaf may probably be found to be in this,—that the cellular tissue or parenchyma, which in the tree and its branches is collected into the pith and bark (which are connected by the medullary rays), is in the leaf so spread out as to fill up the interstices of the fibrous matter which forms the veins.

“The general order as thus stated applies only to the plants which have pith and bark and fully-formed leaves, intended to strike the eye. There is no such special order in plants with linear unbranched leaves, such as firs and pines. The leaf in these plants has no ramified venation, and seems to correspond, not to the whole tree, but to the stem, and in doing so it is more in accordance with the whole morphology of the tree than a veined leaf could possibly be. But while the general order is varied to suit the different physiological structure and form of tree, we discover here the very same general principles of order as we have been discovering elsewhere; for in the firs and pines every internode is of the same structure with every other; every branch tends to assume the outline of the whole tree; *every topmost or growing internode, with its leafage, is of the same form as the tree or branch.* Herein does the special morphology approach nearest to that of the plants with ramified veins; and the very cones are often types of the whole tree, and of every branch.

“We are not prepared to say what is the special law of order in plants of the monocotyledonous class. Some of these, such as our ordinary lilies and grasses, send off no branches; and the leaves of these plants have their veins parallel or nearly parallel to the stem, and have no ramified venation. In regard to palms, they would require to be investigated in their native climes before their special order could be discovered. Some plants of this class, the dictyogens of Lindley, to which belong the yams, have branches like our ordinary forest trees; and it is a curious circumstance, and confirmatory of our theory, that the leaves of these plants have a reticulated structure.

“So far as Fungi, lichens, Algæ, and the whole acotyledonous

plants are concerned, it is evident that they present a repetition of parts homotypal in structure and form, and thus illustrate one general doctrine, that throughout the vegetable kingdom the parts are similar to one another, and in nice accordance with the whole.

“Such facts as the above incline us to the belief that the fibrous veins of the leaf bear a morphological analogy to the stems of the tree. We are inclined to regard the root, the stem, and the leaf as the three distinct members of the fully-developed plant, these three parts, however, being morphologically allied; so that, to adopt the phraseology of Professor Owen, as applied to another subject, they may be called *Homotypes*. The plant thus becomes a unity, with innumerable interesting diversities.

“The same general truth may be arrived at by a reverse process. Looking at the lowest plants in the scale, we at once perceive that they are made up of parts which are a repetition of each other. And we may remark that not only is one part of the same structure as every other, but that when the parts are joined together they are made to assume a set of forms, every one of which is the same as every other, and as the whole. We see, for instance, that every internode of the horsetail is the same as every other, and that the topmost node is a type of the whole plant. We see that in the fern every leaflet is of the same shape as its branch, and that every branch is of the same shape as the whole plant. This, be it observed, is true, not only of the structure of each part, but of the form which the compound structure assumes.

“Rising upward, let us now look at our common herbaceous plants. Some of them, such as the hollyhock, the crowfoot, the lady’s mantle, send out a number of stems from near the root; and these plants send out about the same number of main veins or midribs from the base of the leaf. I examined a great many *Alchemillas*, and found the same number of stems from the root as of main ribs from the base of the leaf; the crowfoot sends out five stems or so from its root, and it has five main ribs in its leaf. Again, it may be observed how every branch, with its leaves, is of the same form as its leaf, and how the branch, with its leafage and the leaf, resemble the whole plant. The common wood anemone sends out three stems; at the top of each of these stems is a compound leaf, divided into three smaller leaves, and each of these smaller leaves has three main veins. Other plants, such as the common thistles and the rag-weed, send up one main stem from the root, and have one main vein in the leaf. Observe, too, how in such plants every leaf, with its ragged leaf, is a type of the whole

plant, with its side leaves or branches. It may be observed, too, how, in these plants last named, the lateral leaves and the lateral veins of leaves both come off at a pretty wide angle.

“In such plants as these it will be acknowledged, I think, that the stems of the plant and the main veins of the leaf seem to follow the same laws, or rather that it is impossible to distinguish between them in some cases, and say what is the main vein and what is a stem. But we may mount higher, and now examine our common trees, and inquire if the veins of their leaves do not follow the same law of direction as the lateral stems from the trunk and branches. No doubt we may expect here to find, owing to the more complicated structure of the plant, and its greater exposure to external influences, that the phenomena will be more complicated, and all that we can expect to discover is a tendency on the part of the ramification of the branches to take the same form as the venation of the leaves. Let us take up a gooseberry leaf and examine it, and we shall find that at the top of a leaf-stalk there go off three very large veins, with two other lesser veins from each of the outer of the three large veins, making in all seven veins from the base of the leaf; and we may notice how the gooseberry, at the top of a short unbranched trunk, sends off a large number of stems. We may now see, too, how the currant leaf, at the top of a leaf-stalk, sends off from its base three main veins (with other two less ones), and how, some little distance above the ground, the trunk commonly divides into three main branches.

“I have already traced some points of analogy between the ramification of the branches and leaf-veins of our common trees. I have examined the mountain-ash, and found that the angle of its leaf-vein is 45° , and that the angle of ramification is also 45° . A dogberry growing near was measured, and gave the angle, both of ramification and venation, as 64° . Here, then, are two trees differing in their angle by 20° , and in each case the angle of branch and vein corresponding. But in carrying out the principle, it is to be borne in mind that the full-grown tree is much more complicated than the young tree or the simple branch. In such cases I apprehend that the leaf represents exclusively the young tree or the branch. This is the case with the laburnum, where the individual leaf represents the branch, with veins going off at an angle of 60° or 70° ; but the trefoil leaf will represent the whole tree, which tends to send off its main branches in threes.

“I think it proper to add, that while strongly convinced that there is a truth in this doctrine, I am at the same time prepared to believe

that it may have to submit to modification, which may correct but will not destroy the general view."

Professor Balfour was not prepared to enter into Dr. M'Cosh's views fully, although there were many plausible statements made by him. Dr. M'C. did not appear to apply his views on the same principle throughout. There could be no doubt that there were normal angles at which branches and veins were given off, but it was not an easy matter to get what might be called typical forms. He hoped that Dr. M'C.'s remarks would lead to an investigation of the subject.

Professor Fleming remarked that he was ill qualified to offer any remarks on the interesting paper which had been read, because he had long been in the habit of restraining his *imagination* in all scientific inquiries. This paper he considered an imaginative one, a hunting after resemblances and overlooking differences, so as to give results by no means to be depended upon. The leaves were organs differing in form, structure, and functions from the stem and branches, and could not, homologically, be compared with them. The nerves of the leaves did not all diverge at the same angle, neither did the branches. These last were exposed to various influences during the life of a tree, and in consequence diverged from the stem at various angles in the different periods of growth. It was therefore a dream of the imagination to hope to determine a typical angle of divergence, when the plant was endowed with a considerable range of variation to fit it for its place in the economy of Nature.

Professor Goodsir had listened to Dr. M'Cosh's paper with much interest, on two accounts: *first*, because it appeared to him that its author had, in endeavouring to reach one of the objects he had in view, embodied another attempt to investigate the laws of organic form by that precise or geometrical method which can alone ultimately elevate Natural History to the platform of the perfect sciences; and *secondly*, because, although he could not admit all the conclusions at which its learned author had arrived, he yet believed the paper to involve a great truth. If he might be allowed to use the expression in reference to a plant, the specific physiognomy of a tree, as a mass, appeared to him to depend on the particular bulk, form, and grouping of its constituent masses. Now, if the form and grouping does not depend upon, it certainly involves, the mode of branching peculiar to the species. Dr. M'Cosh had restricted himself to the investigation of the law which regulated the latter; but he had experienced, and would continue to experience, that apparently at present insuperable difficulty in all such researches, *viz.*, the variation, within certain

limits, of the form of parts, or of the whole of an organized body, according to the particular conditions under which that part or that individual had been developed. Prof. Goodsir suggested that Dr. M'Cosh might be more successful if he would limit his inquiry to the law of ramification of a single judiciously-selected species, and would endeavour to grow that species under such invariable conditions as might afford an approach at least to the typical form of the species. He also believed that before the law which regulates the arrangement of the primary and secondary ramifications of a leaf can be ascertained, attention must be directed to the law of form in the parenchyma itself.

Mr. M'Nab exhibited specimens of *Viola stagnina*, from Bottisham Fen, sent by Mr. Stratton, of the Cambridge Botanic Garden.

Many interesting plants were exhibited from the Botanic Garden, including a large collection of British ferns; also various alpine plants from Mr. Evans, of the Experimental Garden; and a species of *Urtica* from the garden of Isaac Anderson, Esq., Maryfield, which he had raised from seeds received from Dr. Jameson, Quito.

The following gentlemen were elected fellows:—Captain Richard Baird Smith, Bengal Engineers, and Duncan A. C. Fraser, Esq.

After the meeting, the members of the Society and visitors, to the number of about 150, afterwards met, by the invitation of Professor Balfour, in the new museum-room, which was decorated with palms, coloured drawings, dissections of plants, &c., and where tea and coffee, fruit, &c., were provided.

Botanical Society of London.

Friday, July 4, 1851. Mr. G. E. Dennes in the chair.

Mr. J. T. Syme, Curator, exhibited one of the various forms or subspecies usually grouped under the name of *Ranunculus aquatilis*, which had been collected by that gentleman at Guillon Links, Haddingtonshire, early in June. Mr. Syme and others had referred this form either to *R. Baudotii* (= *Batrachium marinum* of Fries) or to *R. confusus* of Grenier and Godron's 'Flore de France,' two very nearly allied plants, and neither of them easily distinguished from some varieties still usually joined with the typical *R. aquatilis*.—*G. E. D.*

*Report of the Botanical Proceedings of the British Association for the Advancement of Science.**

‘ON the Theory of the Formation of Wood and the Descent of the Sap in Plants; by Dr. Lankester.’ The author drew attention to the theory of the formation of wood in plants, and objected to the view that the leaves form the wood, on the ground that the ligneous, like all other tissues, were the result of the growth of cells which were not formed in the leaves, but in all parts of the plant. Wood was formed in all parts of the plant where elongated cells were generated, quite independently of leaves, or the formation of leaves:—as in the lower part of the cut wounds of the stems of plants, in the portions of trunks left when trees were cut down, in the abortive branches formed in the bark of such trees as the elm and the cedar, and in other parts of the vegetable structure. He also objected to the theory of the formation of the ligneous or any other secretion, which might be subsequently appropriated by the cells, in the leaves alone. He maintained that all the facts brought forward to support the theory of the descent of the sap, might be explained on the known fact of the ready permeability of the tissues of the plant. He related the details of experiments performed on the species of Spurge; in which the fluid was found to exude from the stem and branches in these plants, just in proportion to the quantity of fluid contained in the plant above or below the section made. The cells of plants were nourished in two ways:—first, by the sap containing carbonic acid, ammonia, and other substances,—and secondly, by materials, as sugar, gum, &c., formed in the cells. These latter were not formed solely in the leaves, but in all cells. He regarded the leaves as organs by which the water of the sap was got rid of, and by this means a further supply of sap from the earth and atmosphere was insured. This function was performed in subservience to changes which were attributed to a specific vitality.

Prof. Henslow said that he agreed with the views of Dr. Lankester with regard to the theory of the formation of wood proposed by Du

* Extracted from the ‘Botanical Gazette.’ This report, the only one I have seen confined to the science of botany, has been drawn up with great care, and is probably from the pen of the editor of the ‘Botanical Gazette,’ who was a member of the Committee for section D, which comprized Natural History, including physiology. A lengthened report of the entire proceedings will be found in consecutive numbers of the ‘Athenæum.’—*Ed.*

Petit Thouars. He thought it was evident that whatever was the function of the leaf, it did not send down the woody fibres which formed the trunk and branches of exogenous trees. The tracing the woody fibres up to the leaf did not prove their origin there. With regard to the descent of the sap, he did not agree with the author of the paper, who, he thought, took too physical a view of the function of the plant. The leaves were not mere organs of evaporation. They performed the function of exhalation, which was independent of heat, and depended on the vitality of the plant. He believed that the leaves did effect a certain change in the juices brought to them, which changed matter was again taken back into the system of the plant, and there, being taken up by the cells, produced the results which were found in the deposit of lignine and the other secreted matters of plants.

Mr. Huxley quoted the instance of the rapid growth and great quantity of wood formed by the various kinds of Liana of tropical forests as instances in favour of the formation of wood independently of the leaves. These plants had all of them a remarkably small number of leaves.

Prof. Asa Gray believed that the theory of the formation of wood, as held by Du Hamel, Du Petit Thouars, and others, was no longer tenable. The formation of vessels from cells could be easily observed, and in exogenous plants there was no vacuity between the wood and the bark for the woody fibres to be sent down through. Even in the spring of the year, when the sap was passing most rapidly between the wood and the bark, the organic connexion was complete. Whether matter was elaborated in the leaves and sent down into the plant he was not prepared to say, but further experiments were desirable.

Dr. Fowler quoted some experiments which he thought proved that the materials of the growth of the plant were not prepared in the leaves.

Dr. Lankester replied, and stated that at present it appeared to him that the statement of the preparation of gum or any other secretion in the plant which was found subsequently in any other part of the plant, was an assumption that required proof, and that all the phenomena of vegetation were susceptible of a simple explanation.

‘Remarks on the Vitality of Seeds; by Prof. Henslow.’ The author stated that during the last year he had planted several seeds sent to the Committee appointed to report on this subject, and out of those he had planted two had grown. They both belonged to the order Leguminosæ, and one was produced from seed seventeen, and the other from seed twenty years old. On the whole, it appeared that the

seeds of Leguminosæ retained their vitality longest. Tournefort had recorded an instance of beans growing after having been kept a hundred years, and Willdenow had observed a sensitive plant grow from seed that had been kept sixty years. The instances of plants growing from seeds found in mummies were all erroneous. So also was the case, related by Dr. Lindley, of a raspberry bush growing from seed found in the inside of a man buried in an ancient barrow.

Mr. Babington related a case in which M. Fries, of Upsala, succeeded in growing a species of *Hieracium* from seeds which had been in his herbarium upwards of fifty years. Desmoulins recorded an instance of the opening of some ancient tombs in which seeds were found, and on being planted they produced species of *Scabiosa* and *Heliotropium*. Recently some seeds from Egypt were sown in Cambridge which were thought to have germinated, but on examining them they were covered with a pitchy substance, which had evidently been applied subsequent to their germination, and thus they had preserved the appearance of growth through a long period of time.

Dr. Cleghorn stated that after the burning or clearing of a forest in India, invariably there sprung up a new set of plants which were not known in the spot before.

‘Report on the Physical and Economical Effects of the Destruction of Tropical Forests in British India; by Dr. H. Cleghorn.’ Viewing the question in its physical relations, the author drew attention to the climatic influences of the denudation of the surface of the country; he adverted to the known phenomena of decrease of springs, and the consequent diminution of river supplies, as results of the entire removal of the woods which are collected on the highlands, where such supplies usually originate; and while distinctly admitting that wherever the wants of an advancing population require the clearance of forest lands, whether for food or the protection of health, such clearance is to be encouraged, he at the same time insisted strongly on the propriety of exercising a careful vigilance, under well-defined regulations, in all cases in which the above-mentioned causes are not in operation. In considering the economic relations of the question, Dr. Cleghorn availed himself largely of the labours of various distinguished and intelligent observers to illustrate the effects of the existing imperfect system of protection and superintendence. He recorded evidence as to the state of the forests in Malabar, Canara, Mysore, Travancore, the Tenasserim provinces, the Indian Archipelago, and the wooded tracts which skirt the base of the Himalayas. From this evidence, it appears that neither the Government nor the

community derive from the forests all those advantages which they are calculated to afford. There are numerous products of which the value is known and appreciated, but which are collected in ways so rude and wasteful, that it is doubtful whether more of them are not lost in the process than are brought into commerce. There are others, perhaps, more numerous, which are known only to the scientific observer; to these it has been the endeavour of the Committee to direct attention. It is no unauthorized inference, that in the depths of those great forest masses, there may still be many substances which only await recognition by instructed eyes to take their places among the valuable agents of manufacturing industry, social comfort, or medical practice. To correct the first, to extend the second, and to discover the third, are the leading points to which the Committee would direct attention; and they have endeavoured to furnish, to the best of their ability, information calculated to advance each of those interesting ends. The general conclusions which appear to the Committee to be warranted by the various statements of fact and opinion, may be summed up as follows:—1. That over large portions of the Indian empire there is at present an almost uncontrolled destruction of the indigenous forests in progress, by the careless habits of the native population. 2. That in Malabar, Tenasserim and Scinde, where supervision is exercised, considerable improvement has already taken place in the forests. 3. That these improvements may be extended by a rigid enforcement of the present regulations, and the enactment of additional provisions of the following character, viz., careful maintenance of the forests by the plantation of seedlings in the place of mature trees removed; prohibition of cutting until trees are well-grown, with rare and special exceptions for peculiar purposes; in cases of trees yielding gums, resins, or other valuable products, that greater care be taken in tapping or notching the trees, most serious damage at present resulting from neglect in this operation. 4. That special care and attention should be given to the preservation and maintenance of the forests occupying tracts unsuited for culture, whether by reason of altitude or by peculiarities of physical structure. 5. That in a country to which the maintenance of its water-supplies is of such extreme importance, the indiscriminate clearance of forests around the localities whence the supplies are derived is greatly to be deprecated. 6. That as much local ignorance prevails as to the number and nature of valuable forest products, measures should be taken to supply, through the officers in charge, information calculated to diminish such ignorance. 7. That as much information

which may be of practical utility is contained in the manuscript Reports and Proceedings of the late "Plantation Committee," it is desirable that the same should, if practicable, be abstracted and given to the public.

Capt. Strachey said he could not agree with those who thought that forests had much influence on climate. It was a notion that they encouraged rain, but it was more probable that rain was the cause of forests. He alluded to districts in India, in which the forest vegetation was just in proportion to the fall of rain, being small and diminutive where there was little rain, and abundant and gigantic where there was much rain. In temperate climates forests might produce an effect, but certainly not in the tropics. With regard to the economical question, there could be no doubt that it was foolish to destroy what was valuable, but we had not the power to arrest the present destruction of forests in India.

Mr. Bunbury enumerated several instances where forests did not exist, and yet there was much rain, and others where forests existed and there was little rain. Humboldt was our great authority on this subject, and he had recorded his opinions of the influence of forests on climate. In many districts where forests were cleared and single individuals left, these latter soon died from the want of the influence of their neighbours.

Dr. Lankester pointed out that according to the laws of vegetation plants must be supplied with water in a liquid or vaporous form for their growth, and that all the facts which had been mentioned, and which at first sight appeared opposed to each other, might be explained. That forests did not always grow in rainy districts arose probably from the waters accumulating and forming morasses in which forest-trees would not grow. In districts where there was not much rain, there might be much moisture in the atmosphere; rain in general supplied only a very small quantity of the water required by plants. Vegetable physiology afforded no explanation of the effects on climate, attributed by some observers to forests.

Note in reference to the Paper by the late Mr. W. Griffith, 'On the Structure of the Ascidia and Stomata of Dischidia Rafflesiana.'
By GEORGE LUXFORD, F.B.S.E., &c.

THE editorial remarks on the inconvenience arising from delay in the publication of the 'Transactions of the Linnean Society' (Phytol.

iv. 263), are aptly illustrated by the appearance, without note or comment, of this highly interesting paper nearly seventeen years after it was written, and more than five years since it was read before the Society. Mr. Griffith refers to "the commonly adopted opinion," as advocated by Dr. Lindley in his 'Outlines of the First Principles of Botany,' and in his 'Introduction to the Natural Orders,' namely, "that the pitcher is a modification of the petiole, and the lid or operculum of the lamina;" and this is doubtless correct, with regard to such ascidia as occur on *Sarracenia* and *Nepenthes*. But the author does not appear to be aware that in the 'Introduction to Botany,' published in 1832, two years before the date of his own paper, Dr. Lindley explicitly makes a distinction between the pitchers of *Sarracenia* and *Nepenthes*, and those of *Dischidia*, stating that while the former are modifications of the *petiole*, the latter are formed from *leaves*; he does not indeed say from the *lamina*, but from their being placed in contrast with the *petiole*, it is evident that he considers the pitchers of the *Dischidia* to be modifications of that portion of the leaf; and this opinion, which is the one now generally received by botanists, is undoubtedly correct.

In the *Sarracenia*, indeed, these pitchers, which are radical and sessile, may be distinctly seen to be formed by the very deep channelling of the leaf-stalks; in the *Nepenthes*, or Chinese pitcher-plant, the pitcher is more complex and curious in its construction. The petiole, soon after it quits the stem, spreads into a broad leafy phyllodium, which seems to perform the functions of the true leaf; it then contracts, and forms a round, twining, tendril-like cord, of several inches in length; and again expands, and becomes hollowed out, so as to form a very elegant and capacious receptacle. The mouth of this is guarded by a separate little leafy cover, which is connected with the pitcher by a distinct joint; this cover or lid being regarded as the true lamina of the leaf. In the pitchers of *Cephalotus utricularis*, or the monkey-cups of S. America, the petiole would seem to form the lid, and the pitcher itself to be composed of the hollowed lamina, which hangs from it by a hinge. In *Marcgraavia* and *Norantea*, there are also pitchers which are formed of bracts in a similarly modified condition of involution and cohesion.

Lindley, in the second edition of his 'Introduction to Botany,' quotes an interesting passage from Low's Borneo, as serving to corroborate a statement made by a German botanist, in favour of the idea that the pitchers of these plants may in reality be petioles hollowed out near their extremity. It seems to be the earliest leaves of seed-

ling plants alone which assume the condition of complete pitchers ; and no transitions from flat leaves to hollow pitchers have been met with. Low says that the old "stems of *Nepenthes ampullacea* falling from the trees, become covered in a short time with leaves and vegetable matter, which form a coating of earth about them ; they then throw out shoots which become in time new plants ; but apparently the first attempts to form the leaf are futile, and become only pitchers, which, as the petioles are closely imbricated, form a dense mass, and frequently cover the ground as with a carpet of these curious formations. As it continues growing and endeavouring to become a plant, the lamina of the leaves gradually appear, small at first, but every new one increasing in size, until finally the blades of the leaves are perfect, and the pitchers, which, as the leaves developed themselves, have become gradually smaller on each new leaf, finally disappear altogether when the plant climbs into the trees. This formation of the pitcher may afford an instructive lesson to the naturalist, as, though not to the same extent, the principle is perceptible in all of this curious tribe, the leaves of seedlings and weak plants always producing the largest pitchers."

With regard to the functions of these curious organs, there is some difference of opinion. It seems probable that the pitcher of *Sarracenia* is a kind of fly-trap, serving for the capture of insects, which in decay may furnish materials for the growth of the plant, or at all events which may be in some way or other useful in the vegetable economy. The interior of the pitcher of *Sarracenia* is beset with long bristly hairs, pointing downwards ; at the bottom is secreted a honey-like substance, which is very attractive to insects. The insects experience little difficulty in reaching this secretion, but when they endeavour to return, they are prevented by the downward direction of the hairs, and are thus imprisoned like a rat in a wire trap.

In connexion with this part of the subject, I may quote a passage from Smith's 'Introduction to Botany,' chiefly with a view of eliciting information, by inquiring if the curious insect proceedings therein recorded have been confirmed by any subsequent naturalist.

"The economy of the *Sarracenia*, an American genus of which we know four species, and of the East Indian *Nepenthes distillatoria*, deserves particular mention. Both grow in bogs, though not absolutely in the water. The former genus has tubular leaves which catch the rain like a funnel and retain it ; at least such is the nature of *S. purpurea*, *Curt. Mag.* t. 849, whose margin seems dilated expressly for this purpose, while the orifice of the tubular part just below is

contracted to restrain evaporation. Linnæus conceived this plant to be allied in constitution to *Nymphæa*, and consequently to require a more than ordinary supply of water, which its leaves were calculated to catch and to retain, so as to enable it to live without being immersed in a river or pond. But the consideration of some other species renders this hypothesis very doubtful. *S. flava*, t. 780, and more especially *S. adunca*, *Exot. Bot.* t. 53, are so constructed that rain is nearly excluded from the hollow of their leaves, and yet that part contains water, which seems to be secreted by the base of each leaf. What then is the purpose of this unusual contrivance? An observation communicated to me in 1805, in the botanic garden at Liverpool, seems to unravel the mystery. An insect of the *Sphex* or *Ichneumon* kind, as far as I could learn from description, was seen by one of the gardeners to drag several large flies to the *Sarracenia adunca*, and, with some difficulty forcing them under the lid or cover of its leaf, to deposit them in the tubular part, which was half filled with water. All the leaves, on being examined, were found crammed with dead or drowning flies. The *S. purpurea* is usually observed to be stored with putrefying insects, whose scent is perceptible as we pass the plant in a garden; for the margin of its leaves is beset with inverted hairs, which, like the wires of a mouse-trap, render it very difficult for any unfortunate fly, that has fallen into the watery tube, to crawl out again. Probably the air evolved by these dead flies may be beneficial to vegetation, and, as far as the plant is concerned, its curious construction may be designed to entrap them, while the water is provided to tempt as well as to retain them. The *Sphex* or *Ichneumon*, an insect of prey, stores them up unquestionably for the food of itself or its progeny, probably depositing its eggs in their carcasses, as others of the same tribe lay their eggs in various caterpillars, which they sometimes bury afterwards in the ground. Thus a double purpose is answered; nor is it the least curious circumstance of the whole, that an Europæan insect should find out an American plant in a hot-house, in order to fulfil that purpose.”—Ed. 6 (1827), p. 156.

As to the *Nepenthes*, no very positive statement can be given: but it is certain, that of the fluid which is contained in the pitchers, a portion at least is secreted by the plant itself, since the pitchers have been found to contain fluid while yet in a very immature state, and before the first opening of the lid. The interior is clothed with downy hairs; and it is probable that these perform the same functions as in other cases, namely, those of attracting or secreting moisture by the numerous points. The lid of the pitcher is closed in dry weather,

as if to prevent the loss of fluid by evaporation; but in a damp atmosphere the lid opens, and the quantity of fluid contained in the pitcher soon exhibits an increase. Dr. Turner found the fluid contained in the unopened pitcher of a plant of *Nepenthes* which flowered in the Botanic Garden of Edinburgh “to emit, while boiling, an odour like baked apples, from containing a trace of vegetable matter, and to yield minute crystals of superoxalate of potash on being slowly evaporated to dryness;” and Dr. Balfour mentions that other chemists have detected in it muriate of soda, malic and other acids.

Mr. Griffith states that the pitchers of *Dischidia* “appear at no period to contain fluids, but invariably contain one or more branched roots, which, taking their origin from various parts of the petiole, pass down through the opening. These roots are always more succulent and of a lighter colour than those formed in any other part.” From analogy I should have supposed that fluid would have been secreted or collected by the pitchers of *Dischidia* as well as by those of *Sarracenia* and *Nepenthes*; the more especially as the presence of these adventitious roots within the pitchers, as observed by Mr. Griffith, in a great measure confirms the following description, of which I have a note, but I regret to say without any reference as to the authority or anything to show where I met with it.

Dischidia Rafflesiana, a denizen of the Indian forests, has a long twining stem, destitute of leaves until near the summit, which may be perhaps 100 feet or more from the ground. Its supplies of moisture would be uncertain in a tropical climate, were there no provision for storing up what the plant occasionally collects; and with such a provision is it furnished. The edges of the leaves approach each other and cohere, and thus form a hollow pitcher, the upper end or mouth from which it is suspended being open, and adapted to receive whatever moisture may fall upon it in the form of rain or dew: the pitcher is accordingly found always to contain a considerable quantity of fluid. But the most curious part of the whole apparatus is a tuft of absorbent fibres, resembling those of the roots, which are prolonged from the nearest part of the branch, or from the petiole, to which the pitcher is attached, and enter the open mouth of the pitcher, so as to reach the fluid stored up within. These fibres may thus be regarded as secondary roots, serving to absorb and to introduce into the system of the plant the fluid aliment collected in the reservoirs.

GEORGE LUXFORD.

August 15, 1851.

*Notice of 'The Gardener's Magazine of Botany,' Nos. 18 and 19,
July and August, 1851.*

The contributions to the July number are intitled :—

'Acacia grandis,' being a description, history, &c., of a very showy greenhouse shrub, supposed to come from New Holland.

'Vegetable Physiology; by Arthur Henfrey, Esq., F.L.S., &c.'

'On the Culture of Asparagus; by Mr. J. Towers.'

'The points which constitute perfection in the Indian Azalea; by Mr. G. Glenny, F.H.S.'

'Literary Notices:—Hooker's 'Species Filicum,' Hogg's 'British Pomology,' Paul's 'Cultivation of Roses in Pots,' 'Donald on Land-draining,' 'Victoria Regia,' and 'Domestic Pigs.' It requires rather a fertile imagination to trace the connexion of the last-named work with the science of botany. The following remark on the 'Species Filicum' is good and true:—"It appears to us that Sir W. Hooker studies ferns chiefly in his herbarium, which no doubt contains most valuable and extensive materials; but experience teaches us that many ferns cannot be safely dealt with in a dried state, and that to understand them thoroughly, fresh and perfectly developed specimens should be examined. The study of imperfect specimens in Natural History very often leads to the expression of artificial characters extremely puzzling to the student; and if this be true generally, it is especially so in reference to that class of plants which forms the subject of these remarks. Nature in her own proper and complete condition—the living plant—that, whenever practicable, should be made the groundwork of scientific enquiry." Now this brief passage exactly explains the wide discrepancy between the conclusions published by Sir William Hooker, as regards the limits of species, and those which I have ventured to express. Hence arise two schools of investigators—those of the closet and of the field. Every closet-botanist will probably agree with Sir William Hooker in the desire to unite all the forms of spinulose *Lastrea*, while every field-botanist will agree with me in wishing to have them separated; and the latter, in spite of all the prestige attaching to the great name of Hooker, are right, simply because they study "Nature in her own proper and complete condition."

'Reminiscences of Rhododendron Culture; by an Amateur of Leicester.'

'Botanical Fragments:—*Hybrids*. "The leading considerations

with the hybridist in the selection of parents, according to Mr. Cole's experience, should be—1st. Family alliance; 2. Constitutional affinity—that is, choosing two plants with organic similarity of growth, whether bulbous, herbaceous, ligneous, annual or otherwise. Where such distinctive differences exist, though the family alliance is undoubted, no cross has hitherto been produced.” *Campanula coronata*, a beautiful hardy species, with a coloured calyx, arranged in the form of a star. Dr. Morren appears to consider it nothing more than a variety of *C. persicæfolia* of Linneus. *Francisca confertiflora* of a former number is referred by Sir W. Hooker to *Brunsfelsia calycina* of Bentham.

‘*Trichopilia marginata*,’ being the description, history, &c., of a new orchid from New Granada, introduced by Mr. Linden, and first flowered in this country by Mr. Schröder, of Stratford.

‘The Chemistry of Soils and Manures; by Dr. Voelcker.—On the formation of soils—chemical causes; on the formation of soils—mechanical causes.’

‘Theory and Practice of Pruning; by Mr. H. Bailey.—The Peach.’

‘The Rose Garden; by Mr. G. Glenney, F.H.S.’

‘Notes, cultural, critical and suggestive:’—‘Thermic scale of cultivation.’

‘Degeneration of Fruits.’ “In North America there are neither apple, pear, nor peach-trees, of the same sorts as our own, that have not been introduced there. The Europeans, some three hundred years ago, took over the seeds of these trees; but so far from yielding what they yield us, they produced, at least in Virginia, as a first generation, trees *with wild and austere fruit*, and it was not eatable by those accustomed to better things at home. The second generation, sprung from the first American seeds, was not so bad as the first. Each generation was better than its predecessor, but their fruit is still inferior to our own; and what is very curious, the best of theirs differs from ours in taste and essence. These facts, collected by M. Poiteau in Virginia forty-five years ago, show what modifications can be produced by a succession of generations in plants derived from the same seed. If it be objected that the seeds of the fruit-trees originally sent to Virginia did not in this country produce such good fruit as they do at present, still the great fact remains, that the seeds when sown in Virginia yielded something different from what they then yielded in Europe. We see, then, how the new conditions in which fruit trees were placed in North America gave rise to two principal results: 1. By depriving this fruit of the quality it had acquired by

European cultivation; 2. By making it undergo, in the course of successive generations, modifications different from those of the fruit cultivated by us." I will take the liberty of making two remarks on this note: 1st. There is a great tendency in seedlings raised from apple, pear, and peach-trees to revert to something like wildings, *i. e.*, "trees with wild and austere fruit," and this is exhibited as strongly in this country as it can possibly be in America. 2ndly. The mode of transporting our best fruit-trees is not by seed, but by slips intended for grafting. These should be stuck in the flat surface of a potato cut in half, and these half potatoes arranged on some tenacious earth or clay in shallow elm boxes, a large pane of thick tiling-glass being let into the lid; the lids should fit with some exactness, and the boxes should be kept on the ship's decks.

'Destroying weeds upon walks.' 'Correa viridiflora alba.' Varieties of the Cherry. 'Pelargonium odoratum variegatum.' 'The Nectarine a smooth Peach.' Mr. Calver, of Royalton, U.S., some five or six years ago, planted a few thousand peach-stones. The plants were in due time budded, except the end one of each row, which was left as a marker. One of these last year produced a crop of *bonâ fide* peaches and nectarines; both were of small size, but well flavoured.

'Seedling Epacrises.'

'The Genera and Species of Cultivated Ferns; by Mr. J. Houlston and Mr. T. Moore.' The species described in the July number are—*Doryopteris sagittifolia*, *palmata*, and *collina*; *Litobrochia grandifolia*, *denticulata*, *leptophylla*, *polita*, and *vespertilionis*; *Lonchitis pubescens*; *Campteria biaurita*; *Pteris longifolia*, *cretica*, *serrulata*, *umbrosa*, *felosma*, *sulcata*, *Kingiana*, *crenata*, *lata*, *hirsuta*, *heterophylla*, *arguta*, *tremula*, *aquilina*, and *caudata*; and *Onychium lucidum*. The authors regard all those ferns which have what has been termed the double indusium, and which I have separated as a genus, under the name of *Eupteris*, as a single species. These are:—

Pteris aquilina, *Linn.* Great Britain and Madeira.

P. latiuscula, *Desvaux*.

P. lanuginosa, *Bory.* Ceylon.

P. lanuginosa, var. *capensis*. Mauritius and Abyssinia.

P. decomposita, *Presl.* Sandwich Islands.

P. caudata, *Linneus*. Mount Liban (St. Jago de Cuba), Jamaica.

P. recurvata, *Wallich*. Nepal.

P. arachnoidea, *Kaulfuss*. Rio de Janeiro, Brazil, and Trinidad.

P. esculenta, *Forster*. New Holland.

The species in the August number are—*Lomaria Patersoni*, lanceolata, alpina, spicant, nuda, attenuata, auriculata, alta, *Gilliesii*, magellanica, onocleoides, capensis, glandulifera, and *Fraseri*; *Blechnum lanceola*, glandulosum, triangulare, brasiliensis, australe, cartilagineum, occidentale, hastatum, intermedium, gracile, and serrulatum; *Doodia caudata*, media, aspera, and *blechnoides*; *Woodwardia radicans*, onocleoides, and *virginica*; *Scolopendrium vulgare*. Why is the beautiful *Hemionitis* omitted? European specimens sent to me by the late Col. Bory de St. Vincent appear to have the fructification of *Scolopendrium*, *Diplazium plantagineum*, *juglandifolium*, *sylvaticum*, *Shepherdii*, *coarctatum*, *otites*, *decussatum*, *thelypteroides*, *arborescens*, *striatum*, and *subalatum*.

‘Garden Hints for Amateurs.’

‘*Broughtonia lilacina*,’ being the description, history, &c., of a new orchid found in the Island of St. Domingo, and first flowered in this country by Mr. Rucker, of Wandsworth.

‘The Metropolitan June Exhibitions.’

‘The Palmyra Palm’ (*Borassus flabelliformis*).

‘On the elevated temperature of the male inflorescence of Cycadeous Plants; by Dr. De Vriese.’ From Hooker’s ‘Journal of Botany.’

‘Meetings of Societies.’

‘New and Rare Plants.’

The August number contains :—

‘*Escallonia macrantha*,’ being the description, history, &c., of a fine, hardy, evergreen shrub of the order Saxifragaceæ, imported by Messrs. Veitch & Son, of Exeter, from Chiloë, through their collector, Mr. W. Lobb.

‘On Variegation in Plants; by Dr. Morren, from Dodonæa.—The true cause of Variegation.’ The following is the summary with which this paper concludes :—

“(a). Variegation may be regarded as a malady.

“(b). That it has its source in the cellular tissue of the diachyma.

“(c). That it attacks especially the superior mesophyllar system, and spreads by layers, always from above downwards, so as to extend sometimes to the whole of the diachyma.

“(d). That it results from emphysema without puffiness (emphyseme sans boursuflure); on the contrary, with contraction of the tissue usually filled with elaborated sap.

“(e). That this emphysema is confined to the intercellular pas-

sages, the intercellular substance or enchyma being replaced by air or gas, the nature of which is unknown.

“(f). That this emphysema causes the discolouration of the granules of chlorophyll contained in the cellules of the variegated diachyma.

“(g). That the variegation is always produced according to a certain number of types, which are repeated throughout numerous different orders and species; and that all variegated leaves may be distinguished by the following terms:—1, margined; 2, bordered; 3, discoidal; 4, zoned; 5, spotted; 6, reticulated; 7, striped; 8, marbled; 9, variegated by half; 10, variegated at the point; 11, fasciate; 12, entirely discoloured.

“(h). That this last phenomenon constitutes albinism or complete whiteness in the leaf, and is never reproduced from seed, so that it is an individual malady.

“(i). That the occasional causes of variegation are numerous, and have their source in many assignable conditions.

“(j). That variegation is closely connected with disturbed vegetable respiration, and that, consequently, it is to plants what pulmonary emphysema is to animals: with the former, its seat is in the leaves, which are the true lungs of plants.

“(k). That in it this is necessary to distinguish general emphysemas which affect the whole plant from local variegations.”

‘The Beautiful and Picturesque in Garden Scenery.’

‘*Osbeckia stellata*,’ being the description, figure, &c., of a free-growing stove plant of the order Melastomaceæ. It has large, showy, lilac-coloured flowers, and was introduced into this country from the Botanic Garden at Calcutta.

‘On the Application of Coal Soot as Manure; by Mr. J. Towers.’

‘Botanical Fragments:’—‘Chlorosis.’ ‘*Stylidium mucronifolium*.’ Dr. Planchon suggests that the plant described in a previous number under this name is not identical with Sonder’s plant of the same name, and proposes to call it *Stylidium Hookeri*. ‘Stipules of *Cinchona*.’ ‘*Mimosa Bark*.’ ‘Peat.’ ‘Hardy Ferns.’ ‘Reindeer Moss.’ ‘New Fact in Vegetable Physiology.’ These six paragraphs appear to be extracts from the ‘Phytologist’ and ‘Zoologist.’ ‘*Bryanthus erectus*.’ The plant so called has been artificially produced from seed of *Menziesia empetrifolia* fertilized with pollen of *Rhododendron chamæcistus*. The production of a plant intermediate between two recognized genera is of very rare occurrence. It would be a point of great interest to ascertain what would be the character of plants produced from its seed, and whether they remained constant or resumed the characters of either parent.

‘New and Rare Plants.’

‘Literary Notices:’ — Babington’s ‘Manual of British Botany,’ ‘Summer Life on Land and Water at South Queensferry,’ Glenny’s ‘Golden Rules for Gardeners,’ and ‘The Ornamental Flower Garden and Shrubbery.’

‘*Deutzia gracilis*,’ being the description and history of a hardy shrub of the order Philadelphaceæ, introduced from Japan, by Dr. Siebold.

‘Notes, cultural, critical and suggestive:’ — ‘Meudon Pine Culture.’ ‘Distribution of Islands in a Lake.’ ‘Quince Marmalade.’

‘*Allamanda Schottii*,’ being the description and figure of a very brilliant stove plant, with large yellow flowers, of the order Apocynaceæ.

‘On Rain and the Construction of Rain-gauges; by E. J. Lowe, Esq.’

‘Garden Hints for Amateurs.’

‘The Metropolitan July Exhibitions.’

I have great pleasure in knowing that my notices of this excellent journal have induced many of my readers to take it in. This is the aim of such notices, and I cannot help feeling a wish that they were more general. When, for instance, do we ever see a notice of the ‘*Phytologist*’ penned in the same truthful and kindly spirit as those which appear monthly in its own pages?

Notice of the ‘Annals and Magazine of Natural History,’ No. 44, August, 1851.

There is one botanical paper in this number, intituled—

‘Contributions to the Botany of South America; by John Miers, Esq., F.R.S.’

In this paper Mr. Miers describes four species of the genus *Liriosma* of Pöppig, who places it in the order Olacaceæ: these are—*L. candida*, Pöpp., *L. pauciflora*, A. DC., *L. Gardneriana*, A. DC., and *L. Velloziana*, A. DC.

Notice of ‘The Naturalist,’ No. 6, August, 1851.

There is no botanical paper in this number.

*Notice of Hooker's 'Journal of Botany and Kew Garden Miscellany,'
No. 32, August, 1851.*

The papers in this number are intitled as under :—

‘Characters of a New Genus of Compositæ-Eupatoriaceæ; by Asa Gray.’

‘Contributions to the Botany of Western India; by N. A. Dalzell, Esq., M.A.’

‘Sketch of the Vegetation of the Isthmus of Panamá; by M. Berthold Seeman, Naturalist of H.M.S. Herald.’

‘Copy of a Letter addressed by Mr. Spruce to G. Bentham, Esq., dated Santarem, Amazons, Sept. 10, 1850.’

‘Botanical Information :’—‘Death of M. Requier.’ ‘Death of J. E. Bicheno, Esq.’ ‘Cereus triangularis.’

‘Notices of Books :’—‘De Vriese (Dr. and Professor): Descriptions et Figures des Plantes Nouvelles et Rares du Jardin Botanique de l’Université de Leide et des principaux Jardins du Royaume des Pays Bas. Ouvrage dédié à sa Majesté la Reine. Livraison II. Imp. folio. 1851.’ ‘Dr. Wight: Orchideæ of the Neilgherries.’ ‘John Sanders: a Practical Treatise on the Culture of the Vine, as well under glass as in the open air. London: Reeve and Benham. 8vo. 1851.’ ‘Prospectus of a Flora Græca exsiccata.’

The new genus of Compositæ described by Dr. Asa Gray is *Dissothrix*, and the species *D. Gardneri*. It is the *Stevia imbricata* of Gardner in ‘London Journal of Botany,’ v. 458.

The plants described by Mr. Dalzell are—*Didymocarpus cristata*, of the order Cyrtandraceæ; *Cyanotis vivipara*, of the order Commelineæ; *Lepidagathis mitis* and *Barleria elata*, of the order Acanthaceæ; *Terminalia Gella*, of the order Combretaceæ; *Anomospermum excelsum*, *Rottlera urandra*, and *Euphorbia strobilifera*, of the order Euphorbiaceæ; *Begonia integrifolia* and *B. trichocarpa*, of the order Begoniaceæ; *Impatiens ramosissima*, of the order Balsamineæ; *Adenostemma rivale* and *Decaneurum microcephalum*, of the order Compositæ; and *Antiaris saccidora*, of the order Artocarpeæ.

Mr. Seeman’s paper on the botany of Panamá is extremely interesting. The following is an extract :—

“As the Isthmus connects the continents, so does its vegetation combine the floras of tropical North and South America: the virgin forests of Guayana, the vegetable soory groves of the Magdalena, and the oak-woods of the Mexican highlands, are all equally represented.

It is, therefore, not to be expected that the Panamanian flora should exhibit any very striking character, or be distinguished by the presence of strongly delineated forms, like Mexico by its cactuses, Australia by its Epacrideæ, capsular Myrtaceæ, and phyllodineous acacias, or the Cape of Good Hope by its heaths, succulent aloes, stapelias and mesembryanthemums. The want of such forms is so obvious, that a superficial observer would be induced to declare the flora identical with those of the bordering states; a person, however, who investigates more closely, cannot fail to notice the prevailing clothing of the leaves with hair and tomentum, the abundance of greenish, yellow, and white flowers, and the numerical superiority of the natural orders Leguminosæ, Melastomaceæ, Compositæ, Rubiaceæ, Orchideæ, and ferns,—*features* which, although less prominent than those alluded to, still exercise a decided influence on the physiognomy of the vegetation.

“But it must not be supposed that the flora is without certain peculiarities of its own; indeed, it has peculiarities which distinguish it from that of all other countries, and which are calculated to show many a genus and many a natural order in an entirely new light. The most important, perhaps, that might be adduced, is the *Balboa odorata*, *Seem.*, whose discovery has established the union of Passifloreæ and Turneraceæ, embracing, as it does, the chief characteristics of these two families (n. 1922). The genus *Pentagonia* is equally curious, on account of its being the only Rubiaceæ which has yet been found with pinnatifid leaves; it belongs to the subdivision of *Gardeniæ*, and thus forms a clear transition to the order *Lonicereæ*, in which a pinnatifid foliage and a baccate fruit are not uncommon features. Remarkable are two species of *Begonia*, *B. oppositifolia*, *Seem.* (n. 1099), and *B. centradenioides*, *Seem.* (561), both with leaves which are opposite and of unequal size, as is the case with *Centradenia rosea*, *Lindl.*, *Clidemia cyanocarpa*, *Bth.*, *C. fenestrata*, *Bth.*, *C. barbinervis*, *Bth.*, and numerous other Melastomaceæ. Their similarity in habit to some of the Melastomaceæ is really very striking, and will give additional weight to the arguments of those who favour the relationship between the two orders. The *Carludovica palmata*, *R. et Pav.*, is another production of the Isthmus, though not exclusively confined to it, which deserves notice. It has large fan-shaped leaves, and resembles many of the palms so closely that it must always be considered as constituting an important link between Pandaneæ and palms. No less surprising is the occurrence of the genera *Macleania*, *Spherospermum*, and *Cypripedium* in the coast region, in a

temperature far exceeding that in which any of their species have hitherto been known to exist."

"Far different is the vegetation of the Savanas. The ground, being level or slightly undulated, is clothed during the greater part of the year with a turf of brilliant green; groups of trees rise here and there; silvery streams, herds of cattle, and the isolated huts of the natives enliven a scene, over which the absence of palms and tree-ferns throws almost an European character, giving the whole more the appearance of an English park than that of a tract of land in tropical America."

The following extracts are from Mr. Spruce's letter to Mr. Bentham:—

"The specimens now sent are chiefly of plants of the 'Gapo' (as it is called in *lingua geral*), or lands inundated by the rivers and lakes in winter, constituting a breadth of from twenty yards to several miles, according as the land is abruptly ascending or perfectly flat. I have got several more of the minute quasi-ephemeral plants, which spring up as the water recedes. The shores of the large rivers produce scarcely any of these; their waters beat on the sand with too much violence to allow of such frail things existing there; but by the small inland lakes connected with the Tapajoz, and near the creeks at the mouth of some of the igarapés, minute leafless utricularias, erio-caulons, alismas, &c., cover the white sand in thousands. A *Utricularia*, which you will find under No. 1050 (*U. uniflora*, *MS.*), is surely the simplest in its structure of all its family. Stems of the size of an ordinary sewing-needle, fixed into the sand by a small cone of radicles, without leaves, but with a minute tubular 2-lipped bract a little below the flower, which is white and comparatively large, complete the description of its outward aspect. I have often been struck with the wonderful contrast in size which is presented here in both the animal and vegetable world. Under a gigantic *Castanheira*, or a *Caryocar*, may occasionally be seen an almost microscopic *Cyperacea*; and the same lake which produces this fairy *Utricularia*, bears on its bosom the queen of the waters, *Victoria regia*. Another *Utricularia* (Coll. No. 1053, *U. quinqueradiata*, *MS.*) has a peculiarity of structure to me quite novel, though you may have met with it before. It is a small species, with submerged stems and bladdery leaves, but the pedicels, which are about two inches long, have about midway a large horizontal involucre of five rays, resembling the spokes of a wheel. This floats on the water, and supports the upper part of the pedicel in an erect position; the whole recalling a sort of floating

lamp I have seen, especially as the large yellow flower may be considered to represent the flame. The rays are half an inch long, clavate, not hollow, but composed of about six series of large diaphanous cellules. The cellules are convex on the surface, giving the rays a papillose appearance, hexagonal, pale green, with pink interstices. The rays are trifold at the extremity; segments short, twice dichotomous, the last divisions capillary, rarely sacciferous."

"I lately found on the leaves of No. 960, what I at first took for a new *Rafflesiaceae*, and the resemblance to some *Apodanthus* is indeed most striking: it was only by careful examination that I satisfied myself it was really produced by an insect. The perianth (for such it seems) is green in the earliest stage, changing to pink, and afterwards to dull purple, tubular from an oval base, from one to two lines long, and the tube a third of a line broad, hairy within and without with spreading white hairs (though the leaves are nearly smooth); the mouth expanded, 2—5-lobed, sometimes dimidiate; ovary inferior, 1-celled, with one or two pendulous ovules. But these ovules are the true eggs of an insect, for, by examining individuals in progressive states of development, I have traced the formation from the egg of, first, a minute fusiform annulate body, and, ultimately, of a perfect insect with legs and wings. To make the resemblance to a flower more striking, there appears, beneath what I have called the perianth, what seems to be a calyx of four or five erect triangular brownish sepals; but these are really only the torn cuticle by the protrusion of the perianth.

"To explain the form assumed by these excrescences, may we not suppose there has been an attempt to reproduce the tubular 5-lobed calyx of the species (which belongs either to *Inga*, or to some allied genus)? The juices of a plant, when diverted from their ordinary channels, must still go on forming tissue according to some law originally impressed on the species; and I have seen modes of development follow the puncture of an insect, such as in general only long cultivation calls forth. On the same leaves were the nidi of another insect. These were scarcely a line long, globoso-urceolate, regularly 20-striate, containing eggs in the concavity as in the other. They might easily be mistaken for some epiphyllous fungus. I enclose specimens of these productions, and I will afterwards send you a larger species."

Notice of the 'Botanical Gazette,' No. 32, August, 1851.

The papers in the August number are intitled :—

'On *Luzula Borreri*. By W. H. Purchas, Esq.'

'Literature :—'Manual of British Botany. By C. C. Babington, M.A., F.L.S. 3rd Edition.' 'Annals of Natural History,' July, 1851.

'Hooker's Journal of Botany,' July, 1851. 'The Phytologist,' July, 1851.

'Proceedings of Societies :—'British Association' (see *ante*, p. 288). 'Botanical Society of London.'

'Miscellanea :—'Record of Localities.' Mr. Hort communicates that a specimen of *Hieracium* which he received some time ago through the Botanical Society of London, gathered at St. Vincent's Rocks, near Bristol, by Mr. Stephens, and labelled as *H. sylvaticum*, is named *H. gothicum* of Fries by Mr. Babington.

Since the publication of Dr. Bromfield's admirable and elaborate description of a new form of *Luzula* (*Phytol.* iii. 985), Mr. Babington has described it as a species—*L. Borreri*—in the third edition of his Manual. Mr. Purchas has found the species pretty generally distributed around the neighbourhood of Ross, in Herefordshire, always in company with its allies, *L. pilosa* and *L. Forsteri*. In one instance he discovered ripe seeds, which were wanting in all Dr. Bromfield's specimens; these seeds were as large as those of *L. Forsteri*, and, like them, were furnished with a straight blunt crest. Mr. Purchas does not find *L. Borreri* invariably to exceed its congeners in size, as was found by Dr. Bromfield to be the case in the Isle of Wight, but this is generally the case; the leaves also are proportionally narrower than those of *L. pilosa*, and the leafy shoots turn upwards to the surface of the soil more quickly after leaving their point of origin than in that species; hence *L. Borreri* has not the loose half-creeping character of *L. pilosa*, while, on the other hand, it is much less tufted than *L. Forsteri*. Mr. Purchas inclines to regard this plant as a distinct species.

Notice of 'Fasciculi of British Mosses. Collected, arranged, and published by F. Y. BROCAS, at Mr. R. S. Hill's, Basingstoke, Hants.'

I have much pleasure in inviting the attention of my readers to this little work. The specimens are neatly prepared, and the colours admirably preserved by Bentall's botanical paper. Great attention has also been paid to accuracy in naming the specimens in the first fasci-

culus, the only one that I have seen. This undertaking has to contend against several others previously in the field, but the specimens possess a great superiority in colour over any that I have seen.

*Cultivation of Ervum Lens in Scotland.**

QUEENSFERRY bids fair to become celebrated in the history of our industrial resources, through the introduction by Monsieur Achille François Guillerez of a new field-crop into the rotations of Scottish agriculture, founded on the successful acclimatation and culture of the lentil (*Ervum Lens*) in the open air at Queensferry. The *Ervum Lens* is a legume of the most ancient cultivation, having formed, as expressly stated in Genesis, the mess of pottage for which Esau sold his birthright. It has always been extensively used as food in the East. The Arabs account it the species of nourishment best adapted for long journeys through the desert. Certain varieties are, however, esteemed so delicate, as to find access to the tables of luxury; and the food which for twopence will dine six poor persons sumptuously, is, on the Continent, far from being disdained by the rich. Amongst ourselves, the Revalenta Arabica, Ervalenta, &c., offered as regimen for invalids, is, or ought to consist of, the flour of lentils; but these articles are frequently adulterated with the meal of peas, beans, and other legumes. It was when the potato failure began to excite apprehensions respecting the popular subsistence, that M. Guillerez, recollecting the extent to which lentils are rendered available in France, Germany, &c., began to attempt their introduction for food into this country. He found that, although known as a green crop even three hundred years ago in Britain, beyond a small parcel or so grown scientifically in a nursery, the seed of the *Ervum Lens* had never been ripened amongst us. He therefore introduced from France the seeds of two species in general cultivation, and has for several years in succession matured at Queensferry the prolific produce, both of the larger yellow lentil and the small brown. It was a pleasant sight to witness the progress of this interesting crop, although growing upon an unfavourable exposure, in close drills, manured only with sea-weed, after having been acclimatised, when it manifested great luxuriance. Its foliage is a delicate pea-green, its blossom a minute white flower,

* Extracted from 'Summer Life on Land and Water at South Queensferry. By W. W. Fyfe.'

thickly studding the fairy-like tracery of its leaves, and its pods very multitudinous—those of the larger description containing generally only one, and those of the smaller or favorite kind always two, small grains or peas. The attention directed to these efforts by the ‘*Scottish Agricultural Journal*’ has not proved fruitless, for the subject has been brought before the Highland and Agricultural Society of Scotland. Specimens of the produce have been requested (and sent) for the Great Exhibition of 1851, and the matter has been warmly taken up by the press; so that some of our enterprising agriculturists will doubtless follow up the enthusiastic effort of this intelligent French gentleman, by practically adding a new crop to those grown for food in Britain.

Natural Systems of Plants.

By JAMES L. DRUMMOND, M.D., &c., &c.

“WHAT’S in a name?”—There may be much, either for good or evil. Mirabeau asserted that names were things, and the disciples of those systems of botany called natural seem to cling strongly to that idea; and hence, though they admit the word *natural* to be a misnomer, it is much too valuable to be parted with: they confess the impropriety of the term, but continue to hug it with parental affection. An attempt, indeed, is made to slur the matter over by telling us that the word *natural*, in *their* vocabulary, does not mean natural at all. Why, then, is it not abandoned? We are gravely informed that “Nature recognises no such groups” as those found in their works on natural systems; that of this system “Nature herself, who creates species only, knows nothing;” and that “*the* natural system is a chimæra,” but that certain principles being carried into effect, “the result will be *a* natural system.” But what are these principles? Every fabricator of such systems lays down what *he* calls principles, either of his own, or taken partly from the so-called principles of others. But where do we find mention of *a* natural system?—is so modest a title ever made use of? Even so, it would still be a misnomer. “What then is a natural system? If no system exists in nature, *whence* this misnomer? That no such system exists is abundantly evident, yet botanists speak of it as a settled thing; and strange to say, every time such system is propounded, it is always perfect,—no link is wanting to bind its parts into a harmonious whole,

till some new facts or plants are discovered that derange the fair edifice, which has now to be re-constructed only again to be destroyed.”*

Now, is it not derogatory to botanical science that it should be forced to take shelter under the veil of fiction, and that under a false title it should be held up as a model of perfection? The most attractive allurements to its study and adoption, has been that it would, in the easiest way in the world, disclose to us the various properties of plants, and that to medical men it would prove a perfect talisman,—that “it informs the medical inquirer not only of the botanical affinities of the plants, but also supplies him with a knowledge of their properties and qualities. This acquaintance with the properties of even one plant of any order enables him to form some idea of the remedial value of all the other plants in the *same* order, and if needful, to substitute, upon fixed principles, any one of them for that which is more usually employed.” So said Dr. A. T. Thomson,† but he only repeated what every one was expected to believe, and were it *true*, it would have placed this natural system on so high a pinnacle that we might almost overlook the rodomontade and cant so often reiterated about the progress of the science, the advance of the human mind, and the boastings that this misnamed system is the only one capable of casting a lustre over the empire of Flora, while Linneus and all the fathers of botany who preceded him were little better than rushlights glimmering in mist and darkness, the natural system being the true sun which has arisen in the latter days to illumine the deep obscure, and spread its genial effulgence over every flower that blows. But alas! *sic transit gloria mundi*; the “spirit of progress” has proved to be a lying spirit, and the assertion that the natural system will lead us to a knowledge of the properties of plants is a mere fabrication. I have already, perhaps, given evidence enough of this,‡ but I will nevertheless here advance an additional proof, which of itself would be sufficient to refute the vain boasts that have been made on the subject.

The beautiful blue-flowered monk’s-hood (*Aconitum Napellus*), so common in gardens, is intensely poisonous, so much so that the *fiftieth part of a grain* of the alkaloid obtained from it will kill a sparrow in a few minutes. The *Aconitum ferox* of the East Indies is still more powerful; the root “is prevalently used there as an energetic poison,

* Thos. Edmondston, jun., in ‘Phytologist,’ vol. i. p. 761.

† ‘Elements of Materia Medica,’ ed. 2, p. 40.

‡ See ‘Observations on Natural Systems,’ &c.

under the name of bikh or nabee. The tingling of the lips and tongue produced by tasting this root is most intense. Dr. Pereira found that one or two grains of its alcoholic extract will kill a small animal in ten or fifteen minutes, if introduced into the cellular tissue beneath the skin.”* Should not, then, according to the natural system, similar deleterious properties belong to the other species of Aconite? Certainly; but what is the truth? “I have found,” says Dr. Christison, “that *Aconitum Napellus*, *Sinense*, *Tauricum*, *uncinatum*, and *ferox* possess intense acrimony; that *A. Schleicheri* and *nasutum* possess it feebly; and that *A. paniculatum*, *lasiostomum*, *Vulparia*, *variegatum*, *nitidum*, *Pyrenaicum*, and *ochroleucum* do not possess it at all.”† It thus appears that plants must be considered as individual species, and that no reliance is to be placed on any supposed properties as being connected with either classification or generic structure, a few of the Linnean classes excepted. Even the *same* plant may possess different properties at different periods of its growth; thus the acrimony of *Aconitum Napellus* continues in the *leaves* till the *seeds* begin to form; it then rapidly disappears, and when *they* are ripe it is entirely gone, though the seeds themselves are intensely acrid; while, according to the able author quoted, “the leaves of *Aconitum paniculatum* are bland throughout every period of its growth; and so are its seeds, and its root.”

With thousands of similar instances before their eyes, why do the abettors of these systems maintain that they lead to a knowledge of the virtues of plants? Why are their systems called natural when they are not so in any sense whatever? Names *are* things.

“O be some other name!

What’s in a name? That which we call a rose,
By any other name would smell as sweet.”

True, but that which we call the natural system of botany would by any other name lose its magical influence. Change this seductive title, that

———— “palters with us in a double sense;
That keeps the word of promise to our ear,
And breaks it to our hope,”

to some other more consonant to truth, and then try the value of a name; the embryological system would perhaps be the most appropriate appellation, but at all events that of natural is groundless and

* Dr. Christison’s Dispensatory, ed. 2, p. 57. † *Ibid*, p. 54.

false, and therefore unworthy the adoption of men with whom the love of truth should ever reign paramount.

J. L. DRUMMOND.

Belfast, August 16, 1851.

Surrey Locality for Leersia oryzoides.

By ALFRED W. BENNETT, Esq.

THE detection of a rare or local plant in a locality distant from those where it has been before observed, must always be a matter of pleasure to the lover of botany, and especially to the student of the local distribution of plants. Some of the readers of the 'Phytologist' may therefore be interested in hearing that the beautiful and local *Leersia oryzoides*, hitherto known only as an inhabitant of the two counties of Sussex and Hampshire, has been detected in the adjoining one of Surrey. It is no doubt to the circumstance of my having gathered the *Leersia* the previous week at the Brockenhurst station that I owe the discovery of it in this locality. On the 18th instant, when crossing the bridge over the river Mole, at the village of Brockham Green, I noticed a large patch of grass growing in the river, which struck me as bearing a strong resemblance to the *Leersia*, and on examining it more closely I found I was not deceived. The plant is growing in several large patches, among reeds, on both sides of the bridge, and full in view of the public road, at a spot we must have passed hundreds of times. In many specimens the panicle is just protruding beyond the sheath. This is, I suppose, the most northerly locality in which this grass has yet been observed in England. I have not yet succeeded in discovering its usual companion, *Isnardia palustris*; but as there are many other spots in the river in which the *Leersia* is very likely to be found, in some of them the *Isnardia* may yet be detected in company with it. From the occurrence of this grass in three counties of England, it is probable that it may be found to be not uncommon in the southern counties, though from the resemblance of its foliage to that of several other grasses, and the circumstance of its rarely disclosing its panicle, it is necessary to have seen it growing before one can hope to detect it in a new locality.

ALFRED W. BENNETT.

Brockham Lodge, Betchworth,
8th mo. (August) 20, 1851.

Notice of 'Observations on Natural Systems of Botany.' By JAMES L. DRUMMOND, M.D., Professor of Anatomy and Physiology in the Royal Belfast Institution; Author of 'First Steps to Botany,' 'Letters to a Young Naturalist,' 'First Steps to Anatomy,' &c. London: Longman & Co. 1849.

It may possibly be looked upon by some of our readers as a subject of regret that the 'Phytologist' should again be converted into a controversial arena, when its pages might be occupied by matter more generally interesting; but seeing that we have been openly charged with wilfully misrepresenting and maligning the author of the little work bearing the above title (*Phytol.* iv. 211), we consider that an endeavour to set ourselves right with our readers is a duty which we are imperatively called upon to perform. In the first place, however, we beg to assure Dr. Drummond, that in penning our remarks on his 'Observations,' we were actuated by no such feelings as those he is pleased to attribute to us; and that so far from wishing to misrepresent or malign him, our predominant feeling was one of regret, that a gentleman of high standing in science and of acknowledged ability should have laid himself open to critical severity, by the publication of a book which we feel sure must be regarded by every unprejudiced reader as entirely unworthy of his talents.

Wishing to be satisfied that we had not by inadvertence fairly rendered ourselves amenable to the charge of misrepresentation, we have again carefully perused the 'Observations on Natural Systems of Botany,' and must conscientiously reiterate our former opinion, confirmed by this reperusal, that the book is neither more nor less than a lament for the decline of a popular taste for botanical science in Great Britain, consequent upon the endeavours of Dr. Lindley and others to place the study of that science upon a firmer and more philosophical footing than had previously obtained: and at the same time, this reconsideration of the subject has strengthened our conviction, that no one who properly understood what he was writing about would have advanced such futile arguments in support of his opinions as we find in nearly every page of the 'Observations.'

Let us not, however, be misunderstood. There are many—very many—of Dr. Drummond's remarks to the truth of which we most heartily subscribe, as we shall have more than one opportunity of showing as we proceed in our analysis of the contents of this book. In this analysis it is our intention to allow the author generally

to speak for himself, in order that there may be no just ground for a reiteration of the charge of wilful misrepresentation: should we fall into error at any time it will be from a misapprehension of our author's meaning, never from a desire to pervert his intentions.

The author of the 'Observations,' in the letter to which we have referred (Phytol. iv. 211), addressing the editor, says, "the book contains nothing to warrant you or any one else in insinuating that it was written as if the author were overwhelmed with grief;" and that "I used no '*dolorous terms*,' made no '*lachrymose observations*,' and uttered no '*lamentations*,' as is represented in the 'Phytologist.'" Well, perhaps not; peradventure, in the second page of his book, where he is speaking of the devotion to botany formerly exhibited by the ladies, some one else wrote, "There is, however, *I am sorry to say*, little of this now; the enthusiasm is gone, and the culture of the science among the female sex has become, *I am much afraid*, almost extinct." Then again, in the third page, where the superiority of the Linnæan system for leading to a knowledge of plants is referred to, some one has written, "All former methods sank into insignificance before it; and although it is the fashion of the present day to vilify, ridicule, and speak of it as useless, *I greatly fear* that, until it again comes into favour, and obtains the countenance it deserves, botany, as a popular pursuit, will become as dead a letter as it was before the system of Linnæus engaged the attention, and struck with admiration and delight almost all the naturalists of Europe." Again, in page 7, after a quotation from a review of Steele's 'Hand-book of Field Botany' in the 'Dublin Quarterly Journal of Medical Science' for February, 1848, the writer of which controverts Dr. Steele's opinion "that botany is becoming popular among the masses,—that it is a favorite study of the million," and states that at Dublin botany was much more popular forty or even eighty years ago than it is now—after this we find inserted the remark that "what is here said of Dublin may, *I am afraid*, be applied to most other parts." The expressions in *Italics* (which *Italics*, by the way, are our own) are not perhaps either "dolorous" or "lachrymose," in the strict sense of the words—they only mean, according to the Dictionaries, "to be grieved," "to live in terror," and "to be struck with fear; terrified; fearful." And once more, at p. 77, we find the inquiry—"Is it not *deplorable* that such vile names [as those coined by Gray in his Arrangement] should be introduced into the beautiful science of botany?" But then, *deplorable* means nothing more than "lamentable; dismal; sad; calamitous; miserable; hopeless!" Of all these meanings we give

the author the benefit, and admit that he “used no ‘*dolorous terms*,’ made no ‘*lachrymose observations*,’ and uttered no ‘*lamentations*,’ as is represented in the ‘*Phytologist*,’” save and except such as we have just cited.

No one who knows anything of the history of the science will attempt to deny that “when the Linnæan system of botany came to be understood, it was enthusiastically embraced by almost every botanist in the civilized world, and in no country, perhaps, more cordially than in England;” and we freely grant that “all former methods sank into insignificance before it:” as well as that from its ready applicability in comparison with all those methods which had previously been promulgated, “thousands became attached to the pursuit of botanical science, who, but for it, would never have spent a thought upon the subject.” In all this we cordially agree with the author of the ‘*Observations*.’ But the Linnæan system by no means owed its celebrity solely to the ease with which stamens and pistils could be counted. Linnæus was the first botanist to demonstrate the importance of these organs in the vegetable economy; and much of the attention bestowed upon his system, was due to the novelty of its having been founded upon organs previously all but entirely neglected in botanical classifications and arrangements. But this was not all. The great author of this celebrated system combined with the innovation many other changes of the highest importance. He cleared up much of the confusion consequent upon the creeping in of a host of ill-defined and doubtful species, and of varieties considered as species by his predecessors; he framed an admirable code of laws whereby botanical terminology was rendered precise and expressive; but above all, the binominal nomenclature introduced by him freed the memory and charmed by its simplicity, and at once did away with the cumbrous and unwieldy mode of naming plants previously in use. All these improvements tended to fix upon the novel scheme of classification the attention of the learned world, and combined to render its dominion secure until it should have effected its purpose, until that “*primum et ultimum in botanicis desideratum*”—a more philosophical method of arrangement so ardently sought after by its author—should be discovered.

We must here disclaim *in toto* all participation in “the fashion of the present day to vilify, ridicule, and speak of as useless” a system by which so large an amount of good has been effected: we are too much indebted to the Linnæan artificial method to do this; and have ever regretted the course which has been adopted by others in their

zeal to establish a different plan of studying the members of the vegetable kingdom; such a course is, to say the least of it, ungenerous and uncalled for. We will even go further, and freely confess, that as the most strenuous advocates of the modern plan feel an absolute necessity for the employment of some artificial scheme as an aid in their researches into the stations and affinities of unknown plants, we see no valid reason for the utter rejection of the Linnæan artificial system as such an aid. All we contend for is, that the limited amount of knowledge attainable through that system should by no means be looked upon as the sole end and aim of botanical investigation.

There is so much "admired disorder" in the manner in which the 'Observations' are mixed up, that it is by no means easy to follow them out to the conclusions intended to be deduced from them. For example; at p. 3 the author commences a record of his own experience, as well as expresses his intentions in penning the little volume under notice, in the following words:—

"I have not myself, for many years, been attending to botanical pursuits, except occasionally by fits and starts, and then in a great measure for the purpose of renewing the delightful feelings I experienced, when young, in learning my early lessons from Priscilla Wakefield's Introduction to the science; and what has principally urged me to write the present Observations is the hope that, however feeble the effort may be, it may have some effect in assisting to excite similar feelings in the mind of the young botanist, by attracting him, if possible, to study the only easy method of gaining a knowledge of plants that has ever been the offspring of human genius." Then about five-and-twenty pages further on, the author cites the personal experience of Dr. Lindley, as to the perplexities awaiting "a beginner who is unassisted by a tutor," although with fewer difficulties to contend with than most students. "I began," says Dr. Lindley,* "with the Linnæan system, which I was taught to regard as little less than an inspired production; I had plenty of books compiled according to that system to consult, and was fairly driven to seek refuge in the natural system from the difficulties and inconsistencies of that of Linnæus." On this quotation we have the following comment:—

"Now I cannot attach the slightest importance to this confession of the learned writer, for thousands who never had the access to books on Linnæan botany which he had, have not only found it divested of the difficulties he alludes to, but have from only the most limited

* As quoted in the 'Observations,' at p. 29.

number of such books, and from no teaching but what *they* taught, become zealous and delighted cultivators of the science. For my own part, though I advance this as a mere feather in the scale, I had no such advantages, I had no plenty of books on the subject, yet one single Linnæan lesson inspired me with a warm enthusiasm for the science. A medical friend who, during his collegiate studies had attended a botanical course, pointed out to me, in a morning's excursion, the parts of fructification in several wild flowers, and drew a slight sketch of the principles on which the Linnæan classification is founded:—I was enchanted, all was totally new to me, and I felt delighted at the prospect of being soon able to arrive at a knowledge of the plants I might find in my walks; and that naturally was all I then looked to.”—P. 29.

Wading onward now for nearly seventy pages, we arrive at another brief record of our author's experiences,—one of those which renders him “fairly entitled to express” his “opinions and feelings on the subject.”

“Though I had,” he writes, “for a long period been attending little to botanical pursuits, I thought of inquiring into these natural systems, with the impression on my mind, that I was to find something of the highest benefit to everything connected with botanical science; but great, certainly, was my disappointment, on finding them a chaotic mass of contradictions, their boasted advantages a mere fable, and the praises bestowed on them having the most shadowy foundation.”—P. 96.

Having thus given, pretty much in their own words, the early experiences of our author, and those of one whom we cannot help regarding as a high authority in all that relates to botanical science, we may perhaps be allowed to indulge in a little egotistical display by citing, in a very brief manner, our own all but entirely unaided career in the study of botany: advancing it “as a mere feather in the scale;” but a feather thrown up will show which way the wind blows; and our statement will serve to show that there is nothing insuperable in either mode of acquiring knowledge, even when the pursuit is entered upon with fewer advantages than the authorities we have quoted confess themselves to have had at command.

Like Dr. Lindley, and the author of the ‘Observations,’ our acquaintance with botany commenced under Linnæan auspices. Unlike the former, we had no “plenty of books compiled according to that system to consult;” and unlike Dr. Drummond, we had not even the advantage of a friend to point out “the parts of fructification in

several wild flowers," or to draw "a slight sketch of the principles on which the Linnæan classification is founded." But with this difference, we have a fellow-feeling with Dr. Drummond, for Priscilla Wakefield's Introduction was *our* first text-book as it was *his*; and after a time, when Galpine's Compend came into our possession, we managed to learn the scientific appellations of those lovely works of an Almighty Hand with which we had previously lived in friendship and admiration. Then came Smith's 'Introduction to Botany,' and, more valuable still, that admirable author's *magnum opus*, the 'English Flora.' From these works we for the first time found out that there was something to be learned beyond the mere names of plants, something to be acquired beyond the mere ability to refer a plant to its place in the Linnæan system. We are however free to confess that even with the aid of Sir J. E. Smith's 'Grammar of Botany,' the only book containing an exposition of Jussieu's views of classification we could at that time command, we made but little progress in our studies. Nor was the matter much mended with Gray's 'Natural Arrangement,' which afterwards fell into our hands, or even with Lindley's 'Introduction to the Natural System:' and it was not until we met with Jussieu's admirable 'Cours Élémentaire,' that we felt any great inclination to master the difficulties of classification. In 1846 appeared Lindley's 'Vegetable Kingdom,' which at once opened up a new field of inquiry, cleared away many of the doubts and difficulties under which we had previously laboured, and gave us new ideas of the dignity of the science by demonstrating the superior advantages of this mode of studying the natural affinities of plants.

If we have been somewhat prolix in this detail of our own limited experience, we have but to say in excuse that our only wish has been to show that there are no such insuperable difficulties in the path of the student, even should he be deprived of the assistance of a teacher, as the author of the 'Observations' encountered in his attempt to master the details of a system which he seems to have found impracticable.

Reverting now to the earlier portion of the 'Observations,' we find a remark to the truth of which we can most unhesitatingly give in our adhesion, for, like the characters in 'The Critic,' when we *do* agree, our unanimity will ever be found to be *wonderful*. The author states that—

"According to an aphorism of Linnæus, the great and important step in understanding any science is to know things themselves. How can we reason about plants unless we know what these plants

are? We must first have a knowledge of the things we speak, or write, or think, or philosophise about, before we can do any of these to a good purpose, and, therefore, the most useful and important introduction to any science is that which leads fairly to a knowledge of the *things themselves*.”—P. 3.

Granted; but then it must be borne in mind that this *knowledge*, as applicable to the vegetable kingdom, is not limited simply to the ability of determining the name of a plant and its place in a system, as too many botanists of the Linnæan school understand it; on the contrary, in the words of Linnæus himself, “The knowledge of species involves an acquaintance with every kind of science—physical, economical, and medical; indeed, with the whole range of human learning.” Now at this point issue is joined between ourselves and the author, who affirms with a voice of authority that the Linnæan system is “the only easy method of gaining a knowledge of plants that has ever been the offspring of human genius;” and again, that it “is pre-eminent over all other introductions to a knowledge of plants.” On the contrary, we hesitate not to declare from experience, that the Linnæan system by itself is neither the *only*, nor the *most pre-eminent* introduction to a knowledge of plants, as that *knowledge* is to be rightly understood. In this opinion we are fully borne out by Sir J. E. Smith, perhaps the most able expositor of Linnæan principles our own or any other country has produced, and one, moreover, whom the author of the ‘Observations’ will hardly reject as an authority on this subject, since he cites him as a botanist who can on no account be considered superficial. This eminent man, in the Preface to his ‘Grammar of Botany,’ has lucidly stated the respective merits of both the Linnæan artificial system, and the more philosophical method promulgated by Jussieu. The former he says expressly, “is to be understood merely as a dictionary” to enable the student “to make out any plant that may fall in his way. He will learn to reduce such plant to its proper class and order in some systematic work, where he will trace out in progression its genus and species, with everything that any author has recorded of its history or use.” Aye! there’s the rub. “*Everything that any author has recorded* of the history or use” of such a plant may thus easily be traced out; but supposing no author has ever before met with the plant under examination, and, as a consequence, that no record has been made of its “history or use,” how then is the student to proceed? He may readily enough refer it to its Linnæan class and order—Pentandria Monogynia, Decandria Trigynia, or anything else, as the case may be; but here

he must stop, unless he know something of the natural affinities of plants, without a knowledge of which, as Sir J. E. Smith well observes, “the science is truly a study of words, contributing nothing to enlarge, little worthy to exercise, a rational mind.” But in order to gain a knowledge of these “natural affinities,” the artificial system of Linnæus, useful as it is as an index to all that has been recorded of the history and uses of plants, is by no means a necessary adjunct. In teaching we have made use of Lindley’s ‘School Botany’ to some extent, and we venture to assert that that “little book” will do more as an introduction to the true knowledge of plants, than any exposition of the Linnæan system that has ever been written; notwithstanding the *dictum* of the author of the ‘Observations,’ that it never will enable the student to master even the rudiments of the science.

The author further says—“After taking considerable pains to comprehend the natural system, as it is called, I have not been able to find out one single advantage which it possesses; it contradicts itself at every turn, is full of misrepresentation, and so far from being natural, brings together into the same orders plants possessed of the most different qualities and appearance.” And then, quoting from the Preface to the ‘Vegetable Kingdom’ the statement that a genus, order, or class “is called natural, not *because it exists in nature*, but because it comprehends species naturally resembling each other more than they resemble anything else;”—he proceeds to give his own views of some of these *resemblances*, in the following words:—

“Of these resemblances I will give some examples from Dr. Lindley’s ‘Vegetable Kingdom;’ but these, let it be observed, are only a small sample from a multitude, as I will refer only to such plants as almost every one is familiar with. We all know a rose, and we are equally well acquainted with the strawberry; but few persons, I apprehend, would say that they ‘resemble each other more than they do anything else,’ or that they should belong to a family of plants called natural. They belong, however, to the order Rosaceæ, as do many others as unlike roses as can be imagined, and among these is the meadow-sweet, which has no more resemblance to a rose than it has to a beech-tree. Heath is not very like a rhododendron, yet by the magic power of the natural system, the heaths, rhododendrons, azaleas, and arbutuses are all domesticated together in one family or order, along with others as unlike each other as possible; and so it is with almost every one of the 303 orders described in the ‘Vegetable Kingdom.’ In the order Primulaceæ we have the primrose, the cyclamen, and the water violet. In Ranunculaceæ, we find united in

similar bonds the butter-cup, the traveller's joy, the anemone, the hel-lebore, and the marsh-marigold, which *do* bear some similarity to each other; but then, along with these plants, we have the columbine, the larkspur, the aconite, and the peony, which an uninitiated person would pronounce to be very unlike to those preceding. The butter-cup and the larkspur have certainly little resemblance to each other. In the other orders we find similar anomalies throughout; the snow-drop, united with the American aloe—the lily, with the asparagus and butcher's broom—the lupin and trefoil, with the laburnum—the privet, with the ash—the potato, with capsicum and the deadly night-shade—the beautiful little speedwell (*Veronica*), with the tall shepherd's club, snapdragon, globe-flowered buddlea, eye-bright, yellow rattle, and digitalis. But it is unnecessary to point out any more of these most unnatural combinations, and I will only further observe that the honeysuckle meets in the same order with the laurustinus and the elder.”—P. 9.

Before we analyse the various assertions contained in the above extract, we must be allowed to quote a portion of the paragraph next succeeding, which at once accounts for the author's inability to appreciate the advantages arising from the location of plants according to their natural affinities—namely, his ignorance of, or inattention to, the *certain* characters whence the principles of such a mode of arrangement are derived. He says:—

“Supposing that the latter plants, and others in the order in which they have been placed, had a considerable number of *certain* characters in their structure independent of their outward appearance, there might be some shadow of reason for connecting them together; but here, and throughout the whole system, uncertainty and discrepancies are predominant.”—P. 11.

Let us now inquire, how far the above combinations can be said to be “unnatural;” and to what degree a writer is justified in asserting that “throughout the whole system, uncertainty and discrepancies are predominant.”

The author, in the passage last quoted, makes one most important concession; namely, that if the plants he cites, as well as others, “had a considerable number of *certain* characters in their structure, independent of their outward appearance, their might be some shadow of reason for connecting them together;” for this concession we thank him, since it is upon these “*certain* characters” that are founded all the combinations of the vegetable kingdom, as we shall endeavour to show.

“ One touch of Nature makes the whole world kin.”

So says the poet ; and so, with a far wider sphere of application, may say the naturalist : for this magic “ touch of Nature ” establishes a mutual relationship among the three material worlds—animal, vegetable, and mineral—by means of the *certain* characters possessed by their various members. We have at present, however, only the world of plants to deal with, and more especially those species which the author has stigmatized as being most unnaturally combined.

In the first place, then, the whole of the plants mentioned in the preceding extract, with the exception of the snowdrop, the aloe, the lily, asparagus, and butcher’s broom (which are endogens), agree in belonging to the great class of exogens, distinguished by their woody tissue being annually deposited in zones around a cellular centre (the pith) ; in this respect, then, they are primarily united by a *certain* structural character, “ independent of their outward appearance.” But the rose and the strawberry are still more intimately connected by other *certain* characters, in which they “ resemble each other more than they do anything else,” except, of course, the other members of the natural order to which they both belong—the Rosaceæ. As the author says, “ We all know a rose, and we are equally well acquainted with a strawberry ;” and, we may add, most people know a fox-glove. Now we would ask,—Does a strawberry bear as close a resemblance to a fox-glove as it does to a rose, and *vice versâ* ? Few persons, we venture to assert, would reply in the affirmative. And why ? The tall-growing rose and the wand-like fox-glove resemble each other in stature more than either does the lowly strawberry ; what then constitutes the closer resemblance between the strawberry and the rose ? Our author has himself unconsciously furnished a clew to the answer —“ You will know them by their *flowers* ;” for the flowers supply the *certain* characters desiderated by him, as well as the more obvious ones which would lead even the uninitiated to declare the strawberry more like a rose than anything else, except, as we have said, the other members of the rosaceous group.

Beginning with the *form* of the flower : the corolla of the fox-glove is monopetalous and bell-shaped, while those of the rose and the strawberry are composed of five distinct petals, springing from the upper part of the calyx. Here then we have an obvious mark of resemblance between the rose and the strawberry, and as obvious a mark of difference from the fox-glove. But the presence of such a corolla is not a certain character, since other rosaceous plants have no corolla at all ; we must therefore seek for other and more stable

points of resemblance, and these are supplied by the organs of reproduction, which, as the only really essential parts of a flower, are always present at certain periods of the life of a flowering plant; to these therefore we must look for the certain characters in structure which unite the strawberry with the rose.

It is scarcely necessary to say that as in the artificial system of Linnæus, so in the structural* system of Dr. Lindley, the stamens and pistils are employed in characterizing certain groups above genera; in the latter system, however, it is the *insertion* of the stamens that is found to furnish certain characters, not their *number*, which is uncertain and variable, even in the same genus. In both the rose and the strawberry, the stamens are inserted into the mouth of the calyx, a certain character indicating that both plants belong to the perigynous sub-class of exogens: and this mode of insertion of the stamens is essentially the distinguishing character of the twelfth Linnæan class, Icosandria, one of the most natural of all his classes; so that in both systems the rose and the strawberry are associated in the same group, by *certain* characters in their structure, "independent of their outward appearance." But we need not pause here in our inquiry, for the rose and the strawberry are still further structurally related by the character of their carpels being entirely separate and uncombined, thus forming what is technically denominated an apocarpous fruit.

In the certain characters of perigynous stamens and separated carpels the meadow-sweet agrees with the rose and strawberry, as well as in the outward appearance arising from the possession of a polypetalous corolla, and leaves furnished with a pair of stipules at the base of the petiole. The individual, therefore, must be unfortunate who should be unable to perceive any closer resemblance between the meadow-sweet and a rose, or any other member of the same order, than between the former plant and a beech-tree, for either his mental or bodily vision must be strangely distorted.

In the next place, we have the assertion that "heath is not very like a rhododendron," followed by the comment, "yet by the magic power of the natural system, the heaths, rhododendrons, azaleas, and arbutuses are all domesticated together in one family or order, along with others as unlike each other as possible." Allow us to ask, where should plants be located, except with those which possess the same certain characters independent of their outward appearance? In the Ericaceæ, these characters are to be found in the monopetalous

* We use here the term *structural*, out of deference to those who object to the epithet *natural*.

corolla, and the hypogynous stamens with two-celled anthers opening by terminal pores. Unlike the stamens of the *Rosaceæ*, those organs in the *Ericaceæ* spring directly from the base of the ovary, and are entirely uncombined with either calyx or corolla. The carpels, moreover, are united into a many-celled ovary, and are not distinct as in the *Rosaceæ*. The variations in the form of the corolla and number of stamens are not to be taken into account, since these are variable characters. And that a very close relationship really exists between *Rhododendron* and some other *Ericaceæ*, is proved by the artificial production of a hybrid between *Rhododendron chamæcistus* and *Menziesia empetrifomis*—the interesting *Bryanthus erectus*, as reported in the Proceedings of the Botanical Society of Edinburgh (*Phytol.* iv. 156).

Nothing surely can be more natural than the location of the primrose, the *Cyclamen*, and the water-violet in the same order; since they all agree in possessing the certain characters afforded by the monopetalous five-lobed corolla, five epipetalous stamens opposite to the lobes of the corolla, and a free central placenta. The opposite position of the stamens with respect to the lobes of the corolla is an apparent contradiction to the law of alternation, according to which, when equal in number to the petals, they ought to be alternate with them. But the anomaly is apparent only; for in cases like that of *Primula*, it is due to the non-development of an outer whorl of stamens, which, if present, would have normally alternated both with the petals, and with the fully developed inner whorl of stamens. In some species of *Lysimachia*, and in *Samolus*, this outer whorl is actually present in the form of scales, or barren stamens; and in *Primula*, *Hottonia*, and some others, their position is indicated by a shade of colour deeper than that of the petals generally, at the point of junction, and alternating with the petals and the perfect stamens.

The author has himself pointed out, at p. 89, one of the certain characters which unite “in similar bonds” the butter-cup, the larkspur, and other plants, which, in the extract above given, he declares to “have certainly little resemblance to each other.” We allude to “the seed-vessels being numerous and pod-like, as in columbine and larkspur;” and yet these are two of the plants, which, at p. 89, are considered as not so very unnaturally combined, because of this correspondence in the fruit, while at p. 10, in the foregoing extract, their combination is declared to be most unnatural. So far as outward appearance goes, the plants composing the order *Ranunculaceæ* certainly do differ widely; but then in the certain character afforded by

their numerous stamens, standing entirely free from either calyx, corolla, or ovary (hypogynous), and their equally distinct carpels, forming, as they do in the rose, an apocarpous fruit, they all agree most closely. We wonder that the author should allow that "the butter-cup, the traveller's joy, the anemone, the hellebore, and the marsh-marigold," "*do* bear some similarity to each other," while he denies the likeness in the case of others, which agree more nearly from the possession of all the organs of fructification. No order is so well adapted as the Ranunculaceæ, to give the student correct ideas of the comparative value of the floral envelopes and the organs of reproduction, in furnishing characters available for purposes of classification; those derived from the latter organs being *certain*, those afforded by the floral envelopes being in the highest degree uncertain and variable. On this head Lindley has well observed, that among the Ranunculaceæ we find "a very considerable number of plants, differing from each other materially in the nature of their calyx and corolla, but very similar otherwise. Some of them have perfectly distinct sepals and petals, in others these parts seem completely blended together, as in *Caltha* and *Anemone*; in others it is manifest that the former only are present, as in *Clematis*. Those too, which have their parts quite distinct, vary greatly from the real crowfoots in their nature, the calyx or corolla being extended into spurs, and assuming a very irregular condition in various ways, as in [monk's-hood] and larkspur. It is, however, very interesting to find the spurred irregular-flowered plants of this order assimilated with the regular spurless species by means of *Ranunculus acaulis*, an Antarctic species, the petals of which have a socket in their middle, evidently anticipating the spurs of *Aquilegia*, &c."—*Veg. Kingd.* 425.

Amidst all the apparent confusion arising from *no* petals, tubular, spurred, and horned petals which we find in the Ranunculaceæ, two simple *certain* characters give the key to forty-one genera and one thousand species of these plants: these characters are numerous free stamens and distinct carpels.

It is scarcely necessary to occupy much space with an examination of the remainder of the author's objections, which are equally futile with those already adduced: for example, what can be more natural than the union of "the lupin and trefoil with the laburnum," since they differ in nothing but their duration, the two former being herbaceous annuals, and the latter a tree; the papilionaceous flowers and leguminous fruit being the same in all? Then again, that the privet and the ash are naturally located together is proved by the ease with

which all the members of the Oleaceæ, to which they, together with the lilac, the olive, and others belong, may be grafted on each other; “a fact,” as Von Martius observes, “which demonstrates the analogy of their juices and their fibres.” Even the jasmine, so like the Oleaceæ in many respects, will not unite by grafting with any of them. The association of “the potato with capsicum and the deadly nightshade” is equally natural, whether we regard their structure or their properties. The potato (*Solanum tuberosum*) belongs to the same genus as the poisonous nightshades (*S. nigrum* and *S. Dulcamara*), and participates in their deleterious qualities to a considerable extent. The leaves and berries of the potato are poisonous, as are those of the nightshades; the underground stems or tubers in a raw state also partake of the same poisonous nature, and are rendered fit for food only by cooking. The same may be said of the other members of the order; they are all more or less of a poisonous nature. Indeed, as DeCandolle has well observed, “We must not lose sight of the fact, that all our aliments contain a small quantity of an exciting principle, which is necessary as a natural condiment, but which in excess would be injurious.” Nor do we see what objection can be made to the junction of the Veronica with Verbascum and the other Scrophulariaceæ, except on the score of its having only two stamens: this character is uncertain, as we have before shown; but that of insertion on the corolla is certain, as is that of the capsule being two-celled and many-seeded.

The quotation in the ‘Observations’ from the ‘Vegetable Kingdom,’ containing the characters of the order Caprifoliaceæ, only proves the author’s inability to appreciate the advantages of the structural system. When all the parts of the plant are looked to in drawing up the character of an order, that character must necessarily be so comprehensively framed as to meet all the cases of variation that may occur in the non-essential organs; but then there are other organs which furnish the certain character, and these do not vary. For example, the Caprifoliaceæ belong to an alliance—the Cinchonales—the members of which all agree in the possession of an inferior ovary, flowers having both calyx and corolla, the corolla monopetalous, and a minute embryo lying in a large quantity of albumen. The order itself is characterized by its epipetalous stamens, equal in number to the lobes of the corolla, and alternate with them, the anthers straight, and opening longitudinally for the discharge of the pollen, a consolidated fruit, and leaves without stipules. One would have thought

that here at all events the system is scarcely in fairness open to the charge of a predominance of "uncertainty and discrepancies."

In another part of the 'Observations' the author charges a writer in the 'London and Edinburgh Journal,' with "ignorance of Linnæus or his writings;" we fear that the following quotation, which is in some measure connected with the subject we have been discussing, will show that our author is himself fairly amenable to the same charge. He says:—

"I have now given enough to shew that Linnæus, in his *Fragmenta*, considered that natural orders (were the hopeless task to be attempted of forming such) ought to be founded on striking or evident external characters; and this is all I wish to make appear. They were given in the '*Philosophia Botanica*' as hints of the way in which natural orders should be formed. They are very imperfect, as he always declared; and some of them contain genera for which no reason can be given why they are located in the place they hold; but yet he scarcely would have brought together into the same order plants so wholly unlike each other as many we find associated in the systems of the present day: for instance, the snowdrop with the American aloe; the tulip and lily with butcher's-broom; the mulberry with the fig; the castor-oil tree with the box; chickweed with the gaudy pink and lychnis; the snapdragon and digitalis with the beautiful veronica and globe buddlea; the honeysuckle with the laurustinus and the elder; the lime tree with the corchorus; or the hardy and evergreen ivy with the delicate and lowly moschatel. In an artificial system it matters not how incongruous may be the species included in any class or order; but to find such as the above, and hundreds of others, in systems professing to arrange together such plants as are 'more like to each other than to anything else,' is certainly somewhat of the wonderful."—P. 89.

The author has been most unfortunate in the selection of examples of what Linnæus would not have done, since "the immortal Swede" has actually associated in the same order many of the very plants which, according to the preceding extract, "he scarcely would have brought together." For example: in Linnæus's order *Scabridæ* we find the mulberry and the fig associated with *Dorstenia*, *Urtica*, and others which until lately formed the modern order *Urticacæ*. In his *Caryophyllei* the chickweed (*Alsine*) is really placed "with the gaudy pink and lychnis;" we wonder where else it should be placed! Then again, in the Linnæan order *Personatæ*, answering to our *Scrophulariaceæ*, the snapdragon and *Veronica* are included, as they

ought to be; *Digitalis* is placed at the end of the *Luridæ*, quite as unnaturally as it could be anywhere; and the place of *Buddleia* not having been determined, that genus is put with the other unlocated plants at the end of the orders. The lime-tree and the *Corchorus* are in like manner actually placed by Linnæus himself in his order *Culminæ*. As to the non-union of the castor-oil plant with the box, it is a curious fact that the name of the genus *Buxus* does not occur in any one of the natural orders given in the '*Philosophia Botanica*' (ed. 1751); though in the '*English Flora*' it stands as a member of the Linnæan order *Tricoccæ* (equivalent to our *Euphorbiaceæ*), on the authority of Sir J. E. Smith. The American aloe was not placed with the snowdrop, perhaps because Linnæus did not know what to do with it, since we find it, under the name of *Aloë Yucca* among those uncertain plants to which he had not given "a local habitation." Though what objection can be advanced against the location of these two plants in the same order—*Amaryllidaceæ*—further than that the flower-stem of the one is woody and bears a great number of flowers, while that of the other is herbaceous and single-flowered, we do not understand; especially as the flowers agree in having an inferior three-celled ovary, and six stamens with introrse anthers. It is also true that Linnæus does not place "the tulip and lily with butcher's-broom;" but then he does place the latter plant, together with *asparagus*, *Convallaria* and *Gloriosa*, in a most heterogeneous assemblage of plants called *Sarmentaceæ*: and the three genera last named certainly agree with the *Liliaceæ* better than with anything else, and *Ruscus* agrees in its flowers and fruit with *Asparagus* and *Convallaria*. This same order *Sarmentaceæ* also contains "the hardy and evergreen ivy," but not "the delicate and lowly moschatel." Now the latter genus, *Adoxa*, is provisionally placed by Linnæus among his uncertain plants at the end of the orders, and the ivy with *Asparagus*, *Convallaria*, *Ruscus* and others, in *Sarmentaceæ*.

With regard to outward resemblance as the basis upon which natural orders should be founded, the author has the following remarks:—

"That there are groups or tribes of vegetables approaching each other so closely in the general aspect of the species belonging to them, as to be considered not improperly as natural, there can be doubt, and such have been acknowledged at all times; as the grasses, the palms, the pine tribe, roses, heaths, narcissuses, pinks, ferns, mosses, peonies, irises, &c.; but these are all founded on their outward characters, their form of growth, the appearance of their flowers, and other external marks; and when we examine Linnæus's '*Methodi Naturalis Frag-*

menta,' it is evident that in general these were formed on similar grounds."—P. 87.

As an example, let us take the order Sarmenaceæ, to which we have just had occasion to refer. It includes *Ruscus* and other genera to the number of twenty, now distributed among ten orders, belonging to three distinct classes, as follows. Exogens:—*Vitaceæ*; *Cissus*, *Vitis*: *Araliaceæ*; *Hedera*, *Panax*, *Aralia*: *Hippocrateaceæ*; *Hippocratea*: *Menispermaceæ*; *Menispermum*, *Cissampelos*: *Aristolochiaceæ*; *Asarum*, *Aristolochia*. Endogens:—*Liliaceæ*; *Ruscus*, *Asparagus*, *Convallaria*, *Gloriosa*: *Melanthaceæ*; *Uvularia*. Dictyogens:—*Trilliaceæ*; *Medeola*: *Dioscoreaceæ*; *Rajana*, *Dioscorea*, *Tamus*: *Smilaceæ*; *Smilax*. Now we readily grant that there is considerable resemblance in "the general aspect" of many of the species enumerated above; but surely Linnæus, from a consideration of this outward resemblance alone, would scarcely "have brought together in the same order plants so wholly unlike each other" as the "delicate and lowly" lily of the valley, "the hardy and evergreen" butcher's broom, and the tall, branching asparagus; his penetrating eye could detect a closer alliance among these plants founded upon their certain characters; and the very heterogeneous assemblage collected under the order Sarmenaceæ, is of itself an instructive commentary upon the folly of trusting to outward resemblance alone, since it could lead even a Linnæus to associate such opposite genera as the grape-vine and the *Aristolochia*.

At page 18 of his 'Observations,' our author declares that he "can scarcely find a single order of the flowering plants which is not a heterogeneous and incongruous assemblage;" while at page 87 he admits "that there are groups or tribes of vegetables approaching each other so closely in the general aspect of the species belonging to them, as to be considered not improperly as natural, there can be no doubt, and such have been acknowledged at all times; as the grasses, the palms, the pine tribe, roses, heaths, narcissuses, pinks, ferns, mosses, peonies, irises, &c." From this admission one would almost suspect that a very similar passage in Sir J. E. Smith's Introduction had left some vague impression upon the mind of the writer. Sir James asserts that

"The most superficial observer must perceive something of the classification of Nature. The grasses, umbelliferous plants, mosses, sea-weeds, ferns, liliaceous plants, orchises, compound flowers, each constitute a family strikingly similar in form and qualities among

themselves, and no less evidently distinct from all others.”—*Introduction to Botany*, ed. 6, p. 288.

The great misfortune with the author of the ‘Observations,’ and others who have written in disparagement of what are called natural orders, seems ever to have consisted in an utter inability to comprehend the impossibility of representing upon paper the manifold ramifications of all such groups of plants, and their inosculation with others. Such objectors seem to suppose that the boundaries of every group may and ought to be laid down with as much certainty and exactness as the boundary lines of an estate upon a map. All true botanists, from the days of Linnæus downwards, have, on the contrary, been compelled to acknowledge that this is far from being the case; and they have accordingly directed their labours to the investigation of the natural affinities of plants, not without a hope that eventually something of Nature’s plan of arrangement might be discovered. Linnæus long ago declared “*Natura non facit saltus*,”—that she has no abrupt leaps from one being or group of beings to another, but that all demonstrate an affinity with others, like territories depicted in a geographical map: and Sir J. Smith, in the passage immediately following that we have quoted above, goes on to say, with great truth, that

“If the whole vegetable kingdom could with equal facility be distributed into tribes or classes, the study of Botany on such a plan would be no less easy than satisfactory. But as we proceed in this path, we soon find ourselves in a labyrinth. The natural orders and families of plants, so far from being connected in a regular series, approach one another by so many points, as to bewilder instead of directing us. We may seize some striking combinations and analogies; but the further we proceed, the more we become sensible that, even if we had the whole vegetable world before us at one view, our knowledge must be imperfect, and that our ‘genius’ is certainly not ‘equal to the majesty of Nature.’”—*Introduction to Botany*, p. 289.

Dr. Lindley, in the Introduction to his ‘Vegetable Kingdom,’ has still more strongly insisted upon this; and as we think he has by his illustration placed the matter in a clear light, we must be allowed to quote the passage. He states that

“No absolute limits, in fact, exist, by which groups of plants can be circumscribed. They pass into each other by insensible gradations, and every group has apparently some species which assumes in part the structure of some other group. Two countries are separated,

by a river whose waters are common to both banks; in a geographical division of territory the river may be assigned to either the left bank or the right bank, but such an arrangement is arbitrary; and yet the interior of the countries is unaffected by it. So with the groups of plants; it cannot be of any possible consequence whether an intermediate or frontier plant be assigned to one group or another, and convenience alone should be considered in such a matter. This long since led me to offer the following observations, the truth of which, much more experience entirely confirms:—"All the groups into which plants are thrown are in one sense artificial, inasmuch as Nature recognizes no such groups. Nevertheless, consisting in all cases of species very closely allied in Nature, they are in another sense natural."—*Intr. Veg. Kingd.* xxx.

Hence, however, arises the impossibility of so rigidly defining such groups, that their boundaries may at once be recognized by the botanist, and equally the impossibility of his declaring of any such osculant species that it absolutely belongs to such or such a group; since "mathematical precision is unknown in such subjects, and exceptions occur to all known rules." The only way of dealing with such refractory plants is to ascertain the general tendency of their mass of characters, which will for the most part correspond with particular ones: and thus we obtain an approximation to the station to which such plants will ultimately be found really to belong.

Linnaeus taught that both genera and species are the work of Nature; we believe, with Dr. Lindley, that species only are natural, and that all combinations of species are in one sense artificial: but since in genera those species are (or ought to be) associated which agree with each other in the greatest number of points of structure, such groups as genera are in another sense natural. As in orders, so in genera, there are always certain osculant or connecting forms which it is all but impossible to refer with certainty to any one of those other forms with which, notwithstanding their apparent anomalies, they are evidently most naturally allied. And this must be the case in all groups, large and small, which man has contrived as aids to study; since, it is evident to every one who studies Nature as she ought to be studied—to every one who seeks to attain something beyond a mere superficial knowledge of her works—that there is truly no such thing as an abrupt transition from one organized being to another. Our own Ray, in the Preface to his '*Historia Plantarum*,' long ago remarked that "as Nature never passes from one extreme to another except by something lying between the two, so she is accustomed to produce

creations of an intermediate and doubtful character, which partake of both extremes, and so completely connect them, as to render it altogether uncertain to which they most truly belong." So that if it once be admitted (and no true naturalist can doubt it) that every natural being passes into some other by insensible gradations, it must also be admitted that no real limits can be found between one group of such beings and another; and that consequently absolute distinctions between such groups can have no existence in Nature.

So many evidences of the truth of this doctrine are daily forcing themselves on the mind of every naturalist, that in many cases he finds it utterly impossible to frame any verbal definition of a group to which there shall be no exception, and he is virtually constrained to recognize the theory of gradation, at whatever inconvenience, or however repugnant to his preconceived notions. He finds that it is not confined to species alone, but that it also extends throughout all groups above species. How else can we reconcile such opposite extremes of development as we find in every combination, whether of species, of genera, of orders or classes? Nothing, for example, can be more unlike than the oak, which for centuries has braved the storms of winter, and the minute, microscopic fungus, which, as it springs into being as it were instantaneously and without warning, as quickly perishes, and "the place thereof knoweth it no more." Every group of plants furnishes striking examples of these extremes of development. Among Endogens we have palms, plantains, and tree-like liliaceous plants, the giants of their class, strikingly contrasted with the floating *Lemna*, which has no distinction of leaf or stem, and bearing flowers, consisting simply of one carpel and two stamens, without calyx or corolla, and seated in minute slits in the edges of the frond. In the Acrogens we find the tropical tree ferns, with trunks forty feet high, and mosses, some of which are so exceedingly minute, that their parts are utterly undistinguishable by the naked eye. Among the grasses we find the bamboos, growing to the height of a hundred feet, and the exquisite little *Knappia agrostidea*, scarcely half an inch in height. The genus *Salix* presents us with *Salix alba*, a tree thirty feet high, and the diminutive *Salix herbacea*, half a dozen perfect plants of which, roots, stems, flowers and all, may be laid upon a common octavo page. And, to adduce no other instances, "the genus *Ficus*," as Lindley mentions, "contains some species creeping on the ground like diminutive herbaceous plants, and others rising into the air to the height of 150 feet, overspreading with the arms of their colossal trunks a sufficient space of ground to protect a multi-

tude of men." These extremes are most readily recognized; and so are some among the more striking of the intermediate grades of being: some of their relationships and affinities are likewise patent to our finite understanding; and something of the plan upon which they are arranged has been discovered: but beyond the development of a comparatively small number of facts, more or less isolated, we cannot at present boast of having advanced very far in our researches.

One thing, however, is certain, that these gradations of being by no means proceed in linear series. "The chain of being" is a most unapt expression as applied to the works of Nature. Nor is the similitude of the territories on a map a much more appropriate one; since the affinities do not lie on a plane, but are most intricately interwoven in all directions.

A brief mention of a few of what have not unaptly been considered the osculant or connecting forms we have referred to may not be out of place. One of these is the little barren strawberry, as it has been called—one of the earliest heralds of spring. This is a strawberry in everything but its fruit, and was formerly included in the genus *Fragaria*, under the name of *F. sterilis*. The receptacle, however, does not become succulent, as in a true *Fragaria*, but remains dry, with the uncombined carpels reposing upon its surface. This plant has in consequence been removed from the genus *Fragaria*; and after having been considered a *Comarum* by some authors, rests for the present under the appellation of *Potentilla Fragariastrum*.

Drupaceous plants among the *Rosales*, are essentially distinguished from the *Pomaceæ* by their solitary carpels, and the presence of hydrocyanic acid in their tissues; but some *Pruni* have a tendency to produce several carpels, and the formation of hydrocyanic acid in *Cotoneaster microphylla*, and some other *Pomaceæ*, demonstrate the affinity of that order with the *Drupaceæ*.

Then, again, the common garden bean and a peach-tree are very unlike in appearance, and they belong to two apparently distinct so-called natural orders. Nevertheless, *Detarium*, a fabaceous plant, produces a legume so very like the drupe of the *Drupaceæ*, that were it not for the different position of the odd sepal in the calyx with respect to the axis, the two could scarcely be distinguished. And the close affinity between the *Fabaceæ* and the *Drupaceæ* is still further indicated by the abnormal structure of the fruit in *Prunus spinosa* and *P. Padus*, met with in Scotland by Mr. W. Thomson, as recorded in the Proceedings of the Botanical Society of Edinburgh (*Phytol.* iv. 278).

Here we have the *Potentilla* evincing an affinity with three or more genera; some of the *Pruni* and the *Cotoneaster* showing a double transition between the *Pomaceæ* and *Drupaceæ*; and *Detarium* and the abnormal fruit of *Prunus Padus* and *P. spinosa*, indicating that the almond and bean tribes are not so widely separated as from their outward appearance might have been imagined.

But among the classes also we have osculant forms. *Gymnogens* seem to partake equally of the nature of *Exogens* and *Acrogens*; *Dic-tyogens* are both exogenous and endogenous; *Rhizogens* connect *Exogens* with *Thallogens*. Among *Endogens*, the *Alismaceæ* and *Hydrocharidaceæ* seem to approach the *Ranunculaceæ* and *Nymphæaceæ* among *Exogens*: and examples of a similar description might be multiplied *ad infinitum*. This subject has, however, been pursued far enough on the present occasion, and we must proceed on our way.

The author of the 'Observations' falls foul of Dr. Lindley for maintaining the position that "a knowledge of the properties of one plant enables the practitioner to judge scientifically of the qualities of other plants naturally allied to it;" and after adducing numerous examples from the 'Vegetable Kingdom' of the apparently opposite medicinal properties of plants belonging to certain orders, he thus proceeds:—

"How, with such examples before them, men will continue to persist in maintaining the idea that if we know the properties of any one plant included in these so-called natural orders, we can fairly calculate on similar properties being possessed by others, is to me very unaccountable; and still more so, that even medical men of high and most deserved reputation can lend their voice in supporting the delusion."—P. 60.

He then quotes the opinion of Dr. A. T. Thomson, as recorded in that gentleman's 'Elements of Materia Medica,' to the effect that

"The natural system holds out so many advantages to medical science, that there can be one opinion only of its superiority in a practical point of view. It informs the medical inquirer not only of the botanical affinities of the plants, but also supplies him with a knowledge of their properties and qualities. The acquaintance with the properties of even one plant of any order, enables him to form some idea of the remedial value of all the other plants in the same order, and, if needful, to substitute, upon fixed principles, any one of them for that which is more usually employed."—P. 61.

On this passage we have the following comment.

"The only possible way in which I can attempt to account for such

a passage as this, is, that the writer adopted his opinion from hearsay, without examination of the subject, and indeed the confident assertions with regard to the superiority of the natural system and its advantages, though ‘false as dicers’ oaths,’ have been so frequently repeated, that, joined with unmeasured abuse of the Linnæan system, the statements have been received on trust; and yet it is incomprehensible how the fabricators of these systems could so deceive themselves, and not less so, how far they have deceived others. It would be tedious, and I trust unnecessary, to advert farther to the orders of the ‘Vegetable Kingdom,’ and it may suffice to say that the same contradictions characterise the book almost from first to last, and that everything respecting the unanimity of plants in the different orders is as unstable, uncertain, and unsatisfactory, as is the account of their medical virtues.”—P. 61.

This, at all events, is honest and straightforward, as well as thoroughly consistent with what is said in other parts of the book. But “Who shall decide when *Doctors* disagree?” For our own part we believe the truth, as usual, to lie between the two extremes. Without venturing to assert, with Drs. Lindley and Thomson, that the so-called natural system will do *all* that is predicated of it, we can by no means allow, with the author of the ‘Observations,’ that everything connected with it is “unstable, uncertain, and unsatisfactory,” even in a medical point of view. It is quite true, as our author states at p. 49, that the Linnæan artificial system, of which he is there speaking, does not inculcate what he terms “the erroneous doctrine, that the plants contained in its classes or orders are in each characterized by similar properties and virtues;” but then it is equally true, that Linnæus himself, the framer of that system, a hundred years ago declared that “*Plantæ, quæ Genere conveniunt, etiam virtute conveniunt; quæ Ordine Naturali continentur, etiam virtute proprius accedunt; quæque Classe naturali congruunt, etiam viribus quodammodo congruunt:*”* so that this is by no means a new doctrine. With regard to the orders selected as examples of the very opposite qualities possessed by the plants contained in them, surely the author of the ‘Observations,’ as a medical man, must be aware that the very same drug, ipecacuanha, for example, exhibits very different effects upon the human frame, according to the dose in which it is administered. Most of the apparent inconsistencies on this head are reconciled by the passage already cited from DeCandolle, namely, that the same principle which is

* ‘*Philosophia Botanica*,’ § 375, p. 278.

necessarily present in plants in order that they may be useful as articles of diet, may become exceedingly noxious when in excess (Phytol. iv. 318); and that this is actually the case, the experience of every day fully confirms. In all the natural orders, there is one plant or one genus of plants, which exhibits the structural characters of the order in greater perfection and in a higher degree of development than the others; and so, we believe, in all such groups there are plants which possess the peculiar secretions, or properties, of the group in a more highly concentrated degree than the other members of that group. This may be, and probably is, the case, with the seeds of *Lolium temulentum*, which the author adduces as one example of the dangerous tendency of the doctrine of similar qualities in plants belonging to the same natural order; the stimulating principle necessary as a condiment which exists in a slight degree in the seeds of the Gramineæ, is in the seeds of *Lolium* highly concentrated, and consequently noxious. We have an example in the sugar-cane of the concentration of the saccharine principle which pervades, in a greater or less degree, the herbaceous parts of the other grasses, and which renders those parts so grateful and so nutrient to cattle. The silex, again, which all grasses secrete in a greater or less quantity in their stems, is in the stem of the bamboo found in a highly concentrated form, especially at the joints, where it forms the substance called tabasheer; and other examples will occur to the botanist. The injuries inflicted by other grasses upon man and other animals, are purely mechanical, and are not to be adduced as examples of the noxious qualities of the secretions of those plants. We have said enough to show that the author's objections to the system on this head are equally untenable with those brought against it in other respects. By the way, we may mention that we are entirely unacquainted with any place "near London," or anywhere else in England, where *Lolium temulentum* "is grown in large quantities, probably with the nefarious object of adding to the intoxicating quality of distilled or fermented liquors."—P. 50. What are the excise-people about?

At p. 46 the author complains of the "finesse held out on every occasion to the disparagement of the Linnæan botany;" we are afraid that he has, in more than one instance, laid himself open to the charge of doing the same thing in disparagement of structural botany. For example, at p. 12, by adroitly foisting a parenthetical sentence into a quotation from the Preface to the 'Introduction to Botany,' he makes Dr. Lindley say that the *natural system* "teaches the physician

how to discover in every region the medicines that are best adapted for the maladies that prevail in it;" &c. Now Dr. Lindley is not here speaking of any particular system, but of the science of botany generally, independently of systems and methods.

Then, at p. 37, he states that "Dr. Lindley adopts the series of classification laid down by DeCandolle, because he thinks it 'that which is least removed from a natural sequence, and partly because it is convenient and easy for study. But let no one imagine (he says) that I attach the least importance to it.'" Now it happens that these are not Dr. Lindley's words at all; they occur in a passage quoted by him from DeCandolle's '*Théori Elémentaire de la Botanique*;' and immediately follow that author's brief exposition of his series of orders, which series he says he has adopted for the reasons given in the above quotation, but, he adds, "let no one imagine that I attach the least importance to it. The true science of general Natural History consists in the study of the symmetry peculiar to each family, and of the relation which these families bear to each other. All the rest is merely a scaffolding, better or worse suited to accomplish that end."—P. 206, 1st ed.

Whether Lindley's or DeCandolle's, our author ought in fairness and justice to have given the latter part of the above quotation, since that contains the pith of the matter; but it did not answer his purpose to do so.

At p. 85 is the following passage:—

"What appears to me as the great error in the system of Jussieu, was his taking the seed as the basis of his classification; it formed one of sand, on which nothing durable can ever rest; and hence the perpetual tinkering, patching, taking away, adding to, or altering in some way or another his system by every one who undertakes to explain it by writing. If part be Jussieu's, the next is of the author's [what author's?] own concocting; but, at the same time, the single, double, or no lobe of the seeds, form the great divisions on which the fabric is to rest."

In this passage we have a palpable *suppressio veri*—in it the truth is stated, but not the *whole* truth. It is, for example, quite true that in the system of Jussieu "the single, double, or no lobe of the seeds [more correctly, of the embryo] form the great divisions on which the fabric is to rest;" but it is *not* true that this is the only character upon which it is founded, nor is it true that this basis is "one of sand, on which nothing durable can ever rest:" on the contrary, it is perhaps the most stable character that could have been selected as the founda-

tion for a natural method of classification. The author himself is obliged to confess, that "It is no doubt a very curious physiological fact, that plants growing from seeds composed of one cotyledon, have a different vegetation, mode of growth, and structure, from those which grow from two;" but he omits to state in addition, that a due consideration of these structural and physiological differences has led to the discovery of other equally important truths, which, taken in their entirety, form a mass of characters than which nothing can be more stable or more certain. As Lindley observes, "in Natural History many facts which have been originally discovered by minute and laborious research, are subsequently ascertained to be connected with other facts of a more obvious nature; and of this, botany offers perhaps the most striking proof that can be adduced." For example: the two great classes of flowering plants, Exogens and Endogens, as well as the flowerless Acrogens, are now mainly distinguished by those very differences in their "vegetation, mode of growth, and structure," which our author has had the sagacity to perceive are combined with the "single, double, or no lobe" of the embryo. Thus, in Endogens, the obscure characters of the monocotyledonous embryo and the want of order in the mode in which the wood is deposited in the stem, are indicated by the patent ones of parallel-veined leaves and the prevalence of the number three in the floral envelopes and reproductive organs. In Exogens, the net-veined leaves and a quaternary or quinary arrangement of the parts of the flower are equally indicative of a dicotyledonous embryo and wood arranged in zones.

We quite agree with the author in his condemnation of Dr. Steele's 'Hand-book of Field Botany,' indeed we consider the plan on which that work is arranged, as one of the the most unnatural of all the attempts to frame a natural mode of classification; but then we do not agree with him in his assertion that "the system of Linnæus" is "the *only one* that has ever been contrived for leading us easily to the *names* of plants;" for the sea catch-fly (*Silene maritima*), adduced as an example of the difficulties attending the investigation of plants by any other method than the Linnæan, might just as easily be found out by the use of the structural method. For as "there are no other Exogens with polypetalous flowers, opposite undivided leaves without stipules, and stems tumid at the nodi," it is obvious that a plant possessing these characters would be at once referred to the Caryophyllaceæ, and then the determination of its genus and species follows of course. And if that species had been included in the 'School Botany,' its name would as readily be found as by the 'Irish

Flora,' without the trouble of wading through Dr. Steele's *fifteen* points of comparison.

Then again, we have no more friendly feeling than our author towards Dr. Lindley's attempt to Anglicize the scientific names of plants; for many of his so-called English names are more barbarous and far more difficult to pronounce than those he would supersede: nor have we any greater affection for his changes in the names of certain orders, which can only be defended on the score of uniformity in nomenclature.

We can by no means admit, as we have said before, that there is any decline in a popular taste for botany in this country; on the contrary, we believe it to be on the increase: and if medical students are not so enthusiastic in the pursuit of botanical knowledge as they were wont to be, we believe their apparent coolness to arise from the multiplicity of subjects they are now compelled to attend to, rather than from any additional difficulties being thrown in their way by the introduction of a different mode of teaching.

In drawing our remarks to a close, we would beg to assure our readers, as well as the author of the 'Observations,' that we have endeavoured to steer clear of everything that could be misconstrued into misrepresentation. If, in some few instances, our remarks may have appeared rather severe, we have at least the satisfaction of knowing that in penning them we have throughout kept in view the wholesome advice of the poet,

" Nothing extenuate, nor aught set down in malice !"

And we can only regret that the author, in his zealous advocacy of the artificial system of Linnæus, should have pursued a course which is as little adapted to do good service to the cause he is defending, as it is calculated to injure the opposite system. The Linnæan system has ever received more injury at the hands of its injudicious friends than from those who have openly and strenuously opposed it. That there is such a thing as a natural system, we as firmly believe as we do that there is a sun which enlightens and warms the earth; and if botanists have not yet succeeded in discovering it, their failure is to be attributed to their futile attempts to construct such a system, instead of endeavouring to trace out that which has existed from the creation of all earthly things—a system framed by the Creator himself. Hence has arisen all the confusion, the tinkering, and patching of which our author complains with so much justice. But, in the words of Dr. Lindley, "consistency is often only another name for obstinacy," and

we are happy to think that this eminent botanist has been among the foremost, if not *the first*, to shake off the trammels of custom, and pursue the opposite course of investigation and discovery, instead of *construction*.

In these days of rapid progress, it does not answer, in botany or anything else, for a man to take up a scientific subject by fits and starts, and only at long intervals; or he may chance, some fine morning, to find himself in the unenviable position of poor Rip Van Winkle, who, on awaking from his memorable twenty years' slumber in the Kaatskill mountains, found, to his utter confusion, that those years had been a period of revolution—that the portrait of Washington had replaced that of George III. on the sign of the village ale-house, that his once trusty arms were rusted and useless, and that he himself was the solitary admirer and all but the sole remnant of “things that were.”

Botanical Excursion to the Great and Little Dowards, on the Wye, Herefordshire. By ABRAHAM T. WILLMOTT, Esq.

DURING a botanical ramble last month with Mr. Henry Edwards, of this town, through a highly-interesting locality, we discovered *Carex clandestina* growing on the edge of the projecting cliffs of mountain limestone of which the eastern sides of the Great and Little Dowards are composed: we had been led to the spot principally for *Spiræa Filipendula*, which I had observed there last year. As this spot is in the direct route of the Wye tour, so much frequented during the summer months by naturalists and pleasure parties, some account of its botanical and other characters may induce some who now rapidly skim the surface of the beautiful river at their feet, to spend some time in enjoying the magnificent scenery, &c., of the summits of those interesting hills, the scenery of which is of the wildest and most romantic description; huge fragments stand out from the parent cliff, looking often like the remnants of some mighty fortress or the keep and towers of an ancient castle; at your feet flows the peaceful Wye, either buried in woods or meandering through meadows spangled with fleecy flocks: but my object is not so much to repeat the praises so often sung or said of the beauties of the Wye as to direct the naturalist to its treasures. One of the prevailing characters of the mountain limestone is to be full of fissures and caverns, and here it is exhibited to a great extent, indeed at some little dis-

tance a considerable stream becomes suddenly engulfed, and pursues a subterranean course for a considerable distance. The Doward limestone is of a very pure character, producing a very white lime; it was from the similarity of its character to that of Bristol, and from the correspondence of the surface of the rocks to that of those at Clifton, that I was led last year to look particularly for *Carex clandestina*, yet without success; but having just returned from Clifton with its outward appearance well impressed on my eye, I almost immediately recognized it, although nearly obscured by the surrounding vegetation; it was in company with *Geranium sanguineum*, *Hippocrepis comosa*, *Spiræa Filipendula*, *Pyrus Torminalis*, *Serratula tinctoria*, *Carex montana* and *pilulifera*, and in the immediate neighbourhood of *Helleborus viridis* and *fœtidus*, *Aquilegia vulgaris*, *Berberis vulgaris*, *Arabis hirsuta*, *Cardamine impatiens*, *Hutchinsia petræa*, *Saponaria officinalis*, *Hypericum Androsæmum* and *montanum*, *Rhamnus catharticus*, *Anthyllis Vulneraria*, *Pyrus Aucuparia* and *Aria*, *Epilobium angustifolium*, *Sedum Telephium*, *Saxifraga tridactylites*, *Sambucus Ebulus*, *Viburnum Lantana*, *Rubia peregrina*, *Dipsacus pilosus*, *Scabiosa columbaria*, *Lactuca virosa*, *Artemisia Absinthium*, *Inula Helenium*, *Ligustrum vulgare*, *Gentiana Amarella*, *Atropa Belladonna* and a dwarf variety, of about one-third its ordinary size in foliage, fruit and flowers, *Butomus umbellatus*, *Listera Nidus-avis*, *Epipactis ensifolia* and *grandiflora*, *Orchis ustulata*, *Ophrys apifera* and *muscifera*, *Iris fœtidissima*, *Melica nutans*, *Poa distans*, *Festuca ovina*, *Carex pendula* and *digitata*, *Polypodium calcareum* (on both sides the river), *Cystopteris dentata*, *Ophioglossum vulgatum*, and many more highly-interesting species, but not of sufficient importance to enumerate here; but should the tourist be inclined to make a circuit of a mile or two on his return to Ross, he may have the opportunity of gathering, amongst others, *Drosera rotundifolia*, *Narthecium ossifragum*, *Viola palustris*, *Hypericum elodes*, *Scutellaria minor*, and *Anagallis tenella*, at Hankerburg Bog, near Lydbrook; and in the wood adjoining, *Polypodium Phegopteris*, and on the way home *Orchis pyramidalis* and *Polypodium Dryopteris*. The transition limestone on the eastern side of Ross furnishes, I believe, but few peculiarities, in fact I have not been able to find any except *Juniperis communis*, *Astragalus hypoglottis*, and *Cnicus eriophorus*.

ABRAHAM T. WILLMOTT.

Ross, September 4, 1851.

*Report of the Botanical Proceedings of the British Association for the Advancement of Science.**

(Continued from page 292).

DR. CLEGHORN, in answer to a question from Dr. Lankester, gave a short account of the destruction that is now going on in the forests of Isonandra gutta, the plant which yields the gutta percha. The extent of these forests is at present unknown; but the present process of collecting the gum renders it highly probable that the supply of this article may be very considerably diminished.

Prof. Allman exhibited a monstrosity of the common wallflower (*Cheiranthus Cheiri*), in which the stamens were converted into carpels; and from some points in the structure of these metamorphosed stamens, he gathered the inference that the stigmas of the Cruciferae were composed of the union of the two half-stigmas of a normally two-horned stigma.

‘On some Facts tending to show the probability of the Conversion of Asci into Spores in certain Fungi; by the Rev. M. J. Berkeley and Mr. C. E. Broome.’ The species of plants which afforded the materials for the remarks of the authors were the following:—1. *Tympanis saligna*, *Tode*; 2. *Sphæria inquinans*, *Tode*; 3. *Hendersonia mutabilis*, *Berkeley & Broome*. In the first instance a specimen of the *T. saligna* produced both sporidiferous asci and naked spores from the same hymenium. In the second case the *Sphæria* was found growing together in the same matrix with the *Stilbospora macrosperma*, the two plants having a common orifice for the emission of their sporidia and spores. In the third case a specimen of *H. mutabilis* exhibited two cells containing different bodies, each having the character of spores.

Dr. J. Hooker stated, that from his examination of the *Laminariæ* of the Antarctic Expedition, he had no doubt that an ascus might be converted into spores. The examination of this subject was fraught with interest to the botanist, and he hoped further observations would be made.

‘On a Monstrosity of *Lathyrus odoratus* discovered in the Garden of John King, Esq.; by Dr. Lankester.’ In this specimen the papilionaceous petals were reduced to mere scales, the calyx were regular, and the stamens assumed the condition in which they are found in

* Extracted from the ‘Botanical Gazette’ for September.

regular flowers with ten stamens arranged in two rows. The fruits presented a foliar character.

‘Report on the Reproduction of the higher Cryptogamia; by Mr. A. Henfrey.’ This was an instalment of a report, called for by the Association last year, on the recent progress of vegetable physiology, from Dr. Lindley, Dr. Lankester, and Mr. Henfrey. The greater part of this report was taken up by a summary of the facts at present on record respecting the occurrence of the organs termed antheridia and pistillidia in all the higher families of cryptogamic plants—*viz.*, the mosses, liverworts, ferns, horse-tails, club-mosses, and Rhizocarpeæ. After discussing the various debated points, the report concluded:—“Perhaps the time has hardly come for us to arrive at any conclusion on these points. The phenomena in the ferns and Equisetaceæ, as well as in the Rhizocarpeæ, Lycopodiaceæ, and Isoëtaceæ less strikingly, seem to present a series of conditions analogous to those which have been described under the name of ‘alternations of generation’ in the animal kingdom; and seeing the resemblance which the pistillidia of the mosses bear to the ‘ovules’ of the other families, we can hardly help extending the same views to them, in which case we shall have the remarkable phenomenon of a compound organism, in which a new individual, forming a second generation developed after a process of fertilization, remains attached originally to its parent, from which it differs totally in all anatomical and physiological characters. It is almost needless to advert to the essential difference between such a case and that of the occurrence of flower-buds and leaf-buds upon the same stem in the Phanerogamia, as parts of a single plant, yet possessing a certain amount of independent vitality. These are produced from each other by simple extension, by a process of gemmation; while the moss-capsule, if the sexual theory be correct, is the result of a true reproductive process. Moreover, we have the analogy to the increase by gemmation in the innovations by which the leafy stems of the mosses are multiplied. In conclusion, it is remarked, that these anomalous conditions lose their remarkable character to a great extent if we refuse to accept the evidence of sexuality which is brought forward in the report. If the structures are all products of mere extension or gemmation, the analogies which have been supposed to exist between them and the organs of flowering plants all fall to the ground. But, believing that the hypothesis of sexuality is based on solid grounds, the reporter is by no means inclined to allow the difficulty of the explanation of these relations to be urged as a valid argument against their existence. He trusts that the present report may

be the means of attracting new investigators to a subject which presents so many points of interest and importance."

Prof. Henslow referred to the great interest of the questions which Mr. Henfrey had undertaken to report on, and felt sure that every physiological botanist would study earnestly the very valuable report which had been read.

'On the Botanical Geography of the Himalaya Mountains and Tibet; by Capt. R. Strachey and Major Madden.' Capt. Strachey described, by the aid of maps and diagrams, the principal features of the vegetable kingdom in the districts of India in which he had travelled in company with Major Madden.

Dr. T. Thomson, also by the aid of a series of diagrams, representing the distribution of plants in Western Tibet, described the botanical geography of this district.

Dr. J. Hooker observed that Capt. Strachey and Dr. Thomson had done for the Himalaya what Humboldt had done for the Andes. The district of the Himalaya in which he had travelled was not unlike that just described; it was however higher, reaching to 28,000 feet, whilst that first described was only 25,000 feet. In the Sikkim Himalaya the ascents were constantly modified by descents, and there was more rain, and the line of perpetual snow was lower than in Kumáon. Pines were alike abundant in both regions. The larch was abundant in Sikkim, but absent in Kumáon. Rhododendrons numbered thirty-six species in Sikkim, but only six or eight in Kumáon.

Mr. Winterbottom, who had travelled over the same districts with Capt. Strachey and Dr. Thomson, compared the flora of the Alps with that of the Himalaya, and pointed out the comparative richness of the latter. Where firs alone grew on the Alps, a most varied and beautiful vegetation was observed in the Himalaya. There was, however, a great difference in different districts. Where the rains fell and the atmosphere was moist, there the vegetation was most prolific; but where there was a want of moisture, the land was sterile and truly disagreeable to behold. Many of the plants were representative of European species.

The Secretary brought up the Report of the Committee 'On the Vitality of Seeds,' which, in addition to the observations of Prof. Henslow, before recorded, on account of the earliness of the season, presented no new features of interest.

*Results of Physiological Experiments on the Formation of Wood in Plants, made in the Royal Dublin Society's Botanic Gardens, Glasnevin, between the years 1839 and 1851. By DAVID MOORE, Esq.**

It may appear remarkable in vegetable physiology, that what has long been considered an axiom should now be gravely disputed by one of the best physiologists of the present time. Dr. Schleiden, of Jena, in his admirable work, 'Principles of Scientific Botany,' flatly denies that a downward current of elaborated bark-sap either does or can take place in plants, which opinion gives to the experiments I propose to describe much additional interest. At the time my experiments were commenced, and for several years afterwards, the descent of the sap in vegetables does not appear to have been doubted, the whole theory of wood-formation resting on the fact of such being the case. It was, therefore, more with a view of eliciting information on the latter subject, than to prove or disprove that sap circulates, as it has generally been considered to do, that they were undertaken.

Before entering into details, I shall take the liberty of very briefly stating the views held on this important subject by Drs. Lindley and Schleiden, which are entirely antagonistic. The former author, in his 'Theory of Horticulture,' at p. 28, makes the following statement:—"When sap leaves the earth and passes into the stem, it ascends by the woody matter of the finest fibres of the root; having left them, it flows into the new wood from which those fibres emanated, and passes along this until it reaches the leaves; on its return from them it descends through the liber, in part passing off horizontally through the medullary rays. Wherever it passes it deposits a portion of its solid parts," &c. Dr. Schleiden, on the other hand, denies that wood is formed by a descending bark-sap. In his chapter on the "Reproduction of Plants," in 'Principles of Scientific Botany,' p. 535, when treating on grafting, we have the following statement:—"Yet the stock must always exert a greater or less influence on the eye or graft, as the sap brought to it must pass through the cells of the stock, and become changed there. In this case the relations are too complicated to enable us to offer an explanation. All that is known on the subject is detailed in manuals of horticulture. I will mention one case. If the branch of a quick-growing plant is grafted upon a very slow-growing one, as, for instance, the branch of a plum

* Read at the Royal Irish Academy, June 23, 1851.

upon a sloe-stock, the graft will grow rapidly, but not so the stock, which retains its slow-growing character; a striking example of the permanency of the specific life of the stock, and, as it appears to me, affording a fatal argument against the pretended descent of the sap. If a descending bark-sap existed, the sloe-stock would be naturally covered with annual rings of plum wood from the graft, and it would grow in proportion to the growth of the graft, but this is by no means the case, for the new annual rings are formed, not out of a descending bark-sap, but out of a cell development of the cambium already existing in the stock, and having essentially the same characters. The formation of new wood of the nature of the graft has always been taken for granted, in order to prove the descent of the bark-sap; but we find that this wood does not partake of the nature of the graft, and that it must, therefore, be formed independently of any descending juices." These being the views held by the best authorities on the matter at present, I shall now detail my experiments, and show how far they bear on either.

My predecessor, Mr. Niven, had been conducting some physiological experiments before he left the Botanic Gardens, the results of which are already before the public. I consider it, however, only just on my part towards him, that I shall here state my principal experiment to be founded on one he had commenced, though we do not appear to have been aiming to attain similar objects. He had cut several trees more or less through their boles in various ways, one of them a large horse-chestnut tree, then four feet in circumference, and now four feet nine inches. At three feet from the surface of the ground, two deep incisions had been made through the stem, crossing each other at right angles, and reaching the circumference on each side. The tree was thus left growing on four separate pillars of wood, alburnum and bark, but no results, that I am aware of, were deducible from this experiment when I commenced the following. Seeing that it afforded an excellent example for observing the growth of woody matter, as it would form to fill up the perforations through the stem, I examined the portion of the tree where it was cut, and found that the heart-wood was completely dead, and beginning to decay, at both the upper and lower lips of the cut. It therefore could render no assistance whatever for the phenomena of life being carried on through its medium. The ascent of the sap and formation of wood must, then, have depended altogether on the functions of the alburnum and cambium, which rested on the four pillars of dead wood, now simply acting as supports. During the spring of 1839, I had one of the pillars laid bare, thus confining the life-supporting action to the remain-

ing three. In a short time afterwards, granulated masses of cellular tissue began to form on the upper lip of the incision made, and continued to extend down the surface of the bare pillar throughout the summer, whilst the lower lip of the incision remained free from wood-formation. The woody matter continued to increase rapidly through the summer of 1840, extending itself both in perpendicular and lateral directions from the upper lip. On the lower lip two leaf-buds were formed, which produced young shoots, when woody matter began to form at the bases of these shoots; but on their being removed, the further increase of tissue at once stopped. In May, 1841, the masses of cellular tissue and wood had extended from the upper lip so as to touch the lower, and to spread along its surface.

When the junction took place, a second of the pillars was laid bare, as the first had been, and the results were similar. The only difference observable was, that the woody matter did not form so rapidly as it did in the first instance. At the expiration of three more years, a second junction had taken place on the pillar last laid bare. A third was now subjected to the same experiment, the principal difference of results in this case being that no leaf-bud was formed on the lower lip. As soon as the third junction occurred, the fourth pillar was treated as the others had been, the growths of young wood becoming gradually weaker on each succeeding one being the only difference.

Having now detailed the way this experiment was conducted, the facts elicited enable me to deduce:—

1st. That every organ in an exogenous tree may be thoroughly destroyed without causing the death of the plant, provided they are gradually destroyed.

2nd. Exogenous plants, through their vital processes, have the power of again restoring the organs so destroyed.

3rd. The formative energy takes place principally above the wounded portion of the stem, and the newly-formed tissues increase, for the most part, in a downward direction.

Though these results may, at first sight, appear to be little more than confirmations of the old theory of wood-formation, and even the experiment itself in some degree similar to others which have already been made, the latter differs materially from any I know of, in the following particulars. Here the main stem of the tree was operated on, and not the branches only. All the organs were destroyed, including pith, medullary rays, and wood. In the course of twelve years the stem of a large exogenous tree, measuring four feet nine

inches in circumference, has been completely killed in a circular ring seven inches wide, and the organs of vitality again restored, without apparently affecting the health of the tree, which is now, while I write (June, 1851), in full bloom. The results, I conceive, rather than adding confirmation to the established theory, bear out Dr. Schleiden's views in a remarkable manner. It is true, the newly-formed tissue extended from the upper lip of the cut chiefly in the downward direction, and that very little appeared on the lower lip. But the train of reasoning I adopt from these circumstances is that of Dr. Schleiden. The flow of sap by endosmotic process from cell to cell, was interrupted by the alburnum and cambium being cut across on the pillar which was laid bare. It therefore diverged laterally, and followed its natural upward course, on the three pillars where no laceration had been made, which accounts for no growth taking place on the lower lip. On the portion of stem above the cut, a greater degree of formative energy accrued, in consequence of the interruption the endosmotic process met with below. The tissue thus formed would rather extend itself on the vacant space under, *i. e.*, the bare pillar, than upwards, where endosmosis was less vigorous, in consequence of many of the cells being filled with sap of greater density. In this manner it continued to grow until it reached the lower lip of the cut, where its downward course was obstructed, when it spread in a lateral direction over the surface of the lip, as well as upwards, until the bare surface became covered over. During the whole process it did not occur to me that the young wood was formed by a returning bark-sap. The growth seemed gradual and not periodical. The young tissue taking a lateral and upward direction when it met the lower lip, shows that, although the tendency be downwards, it will alter.

A remarkable example of the permeability of the tissues of plants has further been proved through this experiment. From knowing the heart-wood was dead at the part of the stem which was operated on, I was desirous to ascertain whether it continued so to the apex of the tree, which I had some reason to suppose it did, from having, about four years ago, observed a small portion of the top shoot dead. I, however, found the heart-wood full of sap, and apparently very healthy, in a piece of the top shoot which I had lately cut from below the dead part.

With similar objects in view, a second series of experiments have been made, at various times within the last twelve years, by planting cuttings of free-growing plants with their tops downwards. Placed in this way, adventitious roots were protruded, and the plants grew.

Cellular granulations at first appeared on the end which was now uppermost and out of the ground, a circumstance which militates against the inference drawn by some, namely, that the physical law of gravitation operates in causing the sap to descend.

In conducting this experiment, I have invariably found that no cellular callus formed at the lower extremity, as would have been the case had I planted the cutting in the regular way. The young roots were protruded laterally from the bases of leaf-buds under ground; when one or more of these elongated, the axis made a sharp curve upwards, until it regained its natural position. The growth and woody formation went on then in the usual way. In some cases the portion of the cutting above ground remained alive during a considerable period, though no leaf-buds grew on it. It, however, soon died after the ascending shoot gained strength.

This experiment, in my opinion, also tends to prove that no regular return of assimilated bark-sap takes place in the formation of wood, because, if such were the fact, the portion of the cutting above ground would have lived and continued to receive the annual deposits, which was not the case.

The beautiful example I have laid before the Academy of the junction of stock and graft, proves, beyond any manner of doubt, that the two increase by separate growths of their own wood, as thoroughly as if they still grew on separate roots. I cannot, therefore, see how this fact can be got over by those who hold that exogenous plants increase by annual deposits of bark-sap. It will not, however, do to draw final conclusions from isolated cases on a subject in which, if Dr. Schleiden's reasoning be correct, so great a change must necessarily follow in our views of this part of the science of vegetable physiology.

DAVID MOORE.

Glasnevin, Dublin, June, 1851.

Pilularia globulifera growing submerged at Henley Park, near Guildford. By the Rev. W. W. SPICER, M.A.

As Mr. Newman states in his 'History of British Ferns' that he knows no instance of *Pilularia globulifera* growing submerged, it may be interesting to botanists to know that it does so in a large pond or lake on the estate of H. Halsey, Esq., with whom I am now staying, near Guildford, in Surrey. The pond covers eleven or twelve acres.

The spot where the *Pilularia* grows is a long distance from the sides, though near a barren little island, on which there is not a vestige of a fern of any kind. The water is about forty inches deep there. The pond, I ought to add, is in a manner artificial, or at least parts of it. I mean by that, that about a century ago parts of it were dry or marshy, and, as far as I can learn, it was so in the particular part where the *Pilularia* grows. Now, although this takes away from the interest of the plant as being indigenously submerged, yet it fully proves its capability to live and flourish in such a situation. The growth of a century may well establish naturalization! Its mode of growth is by an upward direction of the stem, which loses its creeping character, becomes vertical, and so appears at the surface of the water. The thread-like fronds are produced, as usual, at intervals, but they form a more or less acute angle with the stem. I have not observed any fructification at the base of the fronds. Indeed, had I not seen the circinate vernation I should certainly have passed it by as one of our common water-plants, to which it bears a considerable resemblance, and for which I cannot help thinking it may be sometimes mistaken. I may observe that the *Pilularia* does not exist on the present margin of the pond, nor anywhere else in the neighbourhood that I am aware of.

W. W. SPICER.

Henley Park, near Guildford,
September 18, 1851.

Botanical Society of London.

Friday, August 1, 1851. John Reynolds, Esq., Treasurer, in the chair.

The following donations were announced:—British plants from Miss Griffiths and Dr. Bidwell. ‘Proceedings of the Berwickshire Naturalists’ Club;’ presented by the Club. ‘Pharmaceutical Journal’ and ‘Transactions;’ presented by the Pharmaceutical Society. ‘An Outline of the Flora of the Neighbourhood of Godalming, Surrey, with brief notices of the Geological Features of the District, by J. D. Salmon, Esq.;

presented by the Author. Parts 1 and 2 of the ‘Transactions of the Microscopical Society of London;’ presented by that Society. ‘The Gardener’s Magazine of Botany;’ presented by the Editors. ‘The Flora of Liverpool, by Dr. Dickenson;’ presented by the Author.

The continuation of Mr. Daniel Stock's paper 'On the Botany of Bungay, Suffolk,' was read.

Friday, September 5, 1851. J. D. Salmon, Esq., in the chair.

Sir Coutts Lindsay, Bart., of Grosvenor Square; Mr. I. W. N. Keys, of Plymouth; Mr. W. Wing, of Wandsworth; Mrs. Morgan, of Southsea; Mrs. James, of Uxbridge; Mr. R. Cooke, of Scarborough; and Mr. J. G. Baker, of Thirsk, were elected members.

Mr. G. E. Dennes exhibited specimens of *Leersia oryzoides*, Sw., collected by him at Brockham Bridge, Surrey, on the 30th of August.

The continuation of Mr. Daniel Stock's paper 'On the Botany of Bungay, Suffolk,' was read.—*G. E. D.*

Notice of 'The Naturalist,' No. 7, September, 1851.

The only botanical paper is intituled—

'The Misseltoe (*Viscum album*); by J. McIntosh, Esq.'

As a general observation, I may remark on the extraordinary similarity that is occasionally to be found between the productions of those who have been simultaneously labouring on the same subject. In the present instance I have been greatly struck with the very close accordance of the researches of Mr. McIntosh with those of Mr. Lees, published exactly two months previously: they are not indeed identical; there is a difference of phraseology, a difference of spelling; yet so like that one cannot resist the conviction that Mr. McIntosh allowed Mr. Lees the use of his MSS.; Mr. McIntosh cannot have copied from Mr. Lees, for he makes not the least allusion to him or his book. My space does not admit of large quotation, but the botanist will be amused if he procure the 'Botanical Looker-Out' and 'The Naturalist' for September, and compare *in extenso* the chapters on the mistletoe; I assure him he will find the differences as entertaining as the similarities. However, I will cite a few instances as a sample.

<p>"They considered that whatever grew on the oak was sent from heaven, and as a sign that the tree was the chosen one of God himself."—<i>McIntosh</i>.</p>	<p>"The mistletoe was honoured by the Druids of Gaul and Britain as a heaven-descended plant."—<i>Lees</i>.</p>
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<p>"The misseltoe was very diffi-</p>	<p>"When the end of the year</p>
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cult to be found, even by the Druids, on the oak, and when so discovered, was gathered with the most pompous religious ceremonies.”—*McIntosh*.

“The sacrifice and feast being duly prepared under the tree, they led thither two white bulls, whose horns were bound for the first time. The priest, clothed in a white vestment, ascending the tree, cut off the misseltoe with a golden bill, and received it in a white cloth on the ground.”—*McIntosh*.

“Sir John Colbach published a dissertation in 1720 on the efficacy of the misseltoe against sundry diseases of the nervous system.”—*McIntosh*.

“Even in the present time, in country places, it is supposed to cure diseases, etc., in cattle; and it has been stated that if eaten in a dried state by cows in calf, it will cause abortion.”—*McIntosh*.

approached, the Druids marched with great solemnity to gather the mistletoe.”—*Lees*.

“The sacrifices being ready, the priest ascended the oak, and with a golden hook cut the mistletoe, which was received in a white garment spread for that purpose. Two white bulls that had never been yoked were then brought forth.”—*Lees*.

“Sir John Colbatch published a dissertation concerning the mistletoe, a most wonderful specifick remedy for the cure of convulsive distempers.”—*Lees*.

“The mistletoe seems still to maintain a precarious place in rustic empirical practice. I once asked a farmer who lived in the neighbourhood of my residence what he knew on the subject?—and he said that the mistletoe of the oak, when it could be met with, was a capital thing for a sick cow, but especially after calving.”—*Lees*.

The enumeration of instances in which the mistletoe is found on the oak, present a discrepancy in number, but then Mr. McIntosh’s instances are occasionally reiterative; for instance:—

“5. Ledbury Park, Chepstow.

“6. Near Ledbury.

“7. Castnor Castle, near Malvern.”

Should stand thus:—

“Eastnor Castle, between Ledbury and Malvern, the seat of Earl Somers.”

The oak is probably eighty years of age, and supports four fine branches of mistletoe; it stands a short distance from the path near the second lodge-gate by the side of an old British road passing along the western base of the Malvern Hills.

I could, if in a critical mood, point out instances in which both authors are in error; both have, curiously enough, fallen into the same mistake; but I am so glad to see a botanical paper of such research in the pages of 'The Naturalist,' that I have no inclination to dwell on trivial defects.

Notice of 'The Popular Nomenclature of the American Flora. By
BERTHOLD SEEMANN. Hannover: 1851.'

THIS pamphlet comes to my hand, accompanied by the following note:—

“Kew, Sept. 24, 1851.

“SIR,

“I take the liberty of sending you the accompanying little work. It is my intention to enlarge and improve it as much as possible; but as that undertaking will be attended with a considerable amount of time and expense, I am most desirous of adopting a plan that may be advantageous and generally useful. You would greatly oblige me by reviewing the present fragment in your periodical. You would probably be able to suggest some valuable hints. In order to make the work complete, the co-operation of the local botanists of Great Britain would be required; and as no journal has more influence over them than yours, I beg that you will further my object, by stating the plan I have in view at full length.

“I have the honour to be, Sir,

“Your obedient Servant,

“BERTHOLD SEEMANN,

“Naturalist of H.M.S. 'Herald.'

“To the Editor of the 'Phytologist.'”

I am not aware that I can promote M. Seemann's very laudable object more effectually than by giving the explanatory and very lucid Preface, which is extracted, *verbatim*, below.

“Whoever has paid attention to Botany will have observed that in every country—whatever may be the degree of civilization it has attained—the people have made some advance in discovering the

manifold uses to which plants may be applied, the medicinal and economic virtues they possess, or the noxious qualities, odour, beauty of form, and other prominent peculiarities by which they are distinguished. Wherever this is the case, wherever plants have attracted popular attention, it has given birth to vernacular names. Such names are familiar to thousands, and, while the scientific appellations undergo continued changes, the former descend almost unaltered from generation to generation, and become only extinct when the race that once pronounced them has itself disappeared.

“In an age like the present, when it is one of the great aims to render science popular, names of such a nature ought to receive due consideration. But it has been far from being so. Many botanists think them of not sufficient importance to be enrolled in the books of science, and though others set a higher value upon them, yet no attempt has ever been made to collect all, and to regulate the heterogeneous mass. A well-arranged synopsis of the vernacular with the corresponding scientific names would prove highly useful. It would enable the naturalist to make himself at once acquainted with the most valuable productions of a country, and greatly facilitate his investigations. The medical man, the chemist, the traveller, in fine any one coming in contact with the vegetable kingdom would be equally benefited. By simply asking the native name, they would instantly have the scientific appellation, the key to further inquiries. Occasional mistakes may indeed occur. But these are the exception, not the rule. The vernacular nomenclature is less fallible than it is generally supposed. Tell a Brazilian to show you the Parahiba of his country, and he will point to *Simaruba versicolor*; inform a Chilenian that you are anxious to see the Pichinilla, and he will take you to *Fabiana viscosa*; or ask an Eskimaux to bring the root of the Mashu, and he will fetch that of *Polygonum viviparum*.

“These considerations led to the compilation of the ‘Popular Nomenclature of the American Flora,’ and I would have completed the task had not other labours detained me, and had not afterwards the conviction been forced upon me that it would be advisable, instead of confining myself to America, to extend the plan, and enumerate the popular names of the plants of the whole world. Though experience has taught me that in an undertaking of this nature perfection can only be reached in the course of centuries and by the combined efforts of many, still I am convinced a certain degree of completeness is attainable. At present, however, I am unable to execute this plan; want of time and materials prevent me.

“Botanists in every corner of the globe are therefore solicited to furnish contributions, either addressing them to the author,* or making them known by means of the press. It is scarcely necessary to add that every word has to be reduced to the Roman alphabet, and that great care is required in collecting the names. In districts where a provincial dialect prevails the names must be in accordance with it. For instance, in Northern Germany the ‘*plattdeutschen Namen*’ should be written as they are pronounced. In translating them into ‘*Hochdeutsch*’ the object of the nomenclature is frustrated; confusion created.

“The following pages, which can only be looked upon as a mere fragment, contain all the vernacular names of American plants collected during my travels; I have also employed those cited by different authors. My principal authorities have been the writings of Aublet, Bridges, Cruckshanks, DeCandolle, Gardner, Gillies, Hooker, Humboldt and Bonpland, La Llave and Lexarza, Martius, Miers, Pursh, Ruiz and Pavon, Torrey and Gray, &c. I have also incorporated a list of Mexican names annexed to B. de Sahagun’s ‘*Historia General de las cosas de Nueva Espana*,’ which, according to the editor of the work, was formed by V. Cervantes, greatly augmented by P. de Llave, and finally published by M. Bustamente, Professor of Botany in the University of Mexico.

“The nomenclature has been divided into two parts, like a dictionary, one containing the vernacular-scientific, the other the scientific-vernacular names. The names are arranged in alphabetical order, and spelt either according to the prevailing language of the country in which they are current, or that to which they belong. They are given as popular currency has rendered them, and are neither corrected, because they are not in accordance with their derivation, nor altered, on account of their erroneous grammatical construction. They are never translated from one language into the other, nor have any translated names—the useless encumbrance of scientific works—been received. One and the same name being often applied to several plants in different countries, each name is followed by that of the state in which it has currency, and succeeded by the name of the person on whose authority it is given. By following this mode of quotation, I have succeeded in solving the puzzle which hitherto seems to have deferred many an author from attempting the task I have undertaken.”

“ * Mr. Berthold Seemann, Kew, near London.”

I sincerely hope that botanists in this country will cordially assist in promoting M. Seemann's views. It appears to me that he has undertaken a gigantic labour, and one very difficult of accomplishment; but of this surely those who may hope to benefit by his labours have no right to complain, but, on the other hand, should do all in their power to relieve his shoulders from a portion of the burthen. Being, as it were, invited to offer a criticism, I may say that the plan of arrangement, as regards typography, does not appear to me the most lucid: the author seems to have scarcely made sufficient allowance for the shortcomings of those whose scientific attainments are less extensive than his own. Take, for instance, the following line:—

“Calaguala, Huyllay. Cruck. Acrostichum.”

This will immediately convey to a Hooker, or a Brown, the required information, that Calaguala is a native name; Huyllay, a country; Cruck., an authority; and Acrostichum, the modern genus to which the plant belongs: but, certainly, to many a tyro the same information will not be conveyed. I take the liberty of suggesting to the author, whether the list would not be rendered more generally intelligible by adopting the tabular method of arrangement, and by italicizing the authority for the technical name; thus:—

<i>Native Name.</i>	<i>Country.</i>	<i>Authority.</i>	<i>Scientific Name.</i>
Calaguala.	Huyllay.	Cruck.	Acrostichum, <i>Linn.</i>

The heading to be repeated on every page.

It will be impossible to read some of the Mexican names without being reminded of the legend which tells of the invading Spaniard, whose jaw was dislocated in the fruitless attempt to pronounce one of them. Take, for instance, the following specimens:—

“Corticoatzontecxochitl.

“Cozticzacatzacuchotitl.

“Macpalxochitlquahuitl.”

I am very glad the author uses the Roman characters. Only think of such words in German or Russian letters!

New Localities for Mistletoe on the Oak; with some Remarks in reference to a Paper on the Mistletoe in 'The Naturalist' for September, by Mr. McIntosh. By EDWIN LEES, Esq., F.L.S.

WHEN a person writes an essay upon any subject, it is advisable to ascertain *first* what has been done on the subject before, and by whom. It would be then seen at once whether anything new can be brought forward, or any old opinion sustained or controverted.

In the last number of the 'Phytologist' (Phytol. iv. 351) are some editorial remarks on a paper in 'The Naturalist' for September, on the mistletoe, by J. McIntosh, Esq., and "the very close accordance of the researches of Mr. McIntosh with those of Mr. Lees, published exactly two months previously," is suggested. It is further stated "that one cannot resist the conviction that Mr. McIntosh allowed Mr. Lees the use of his MSS.; Mr. McIntosh cannot have copied from Mr. Lees, for he makes not the least allusion to him or his book." Now this idea seems rather strange. If I had been just coming out of chrysalis, I might have wanted some one's aid to fly; but having, in my humble way, scribbled about matters of botany and natural history for the last twenty years, I have too many MSS. of my own to wish to wade through those of others; and certainly the writings of Mr. McIntosh are quite unknown to me, at least as far as the mistletoe is concerned.

But, in fact, it is quite a mistake to suppose that we "have been *simultaneously* labouring on the same subject;" for my account of the mistletoe was actually written as far back as 1839, and read the same year before the Cheltenham Literary and Philosophical Institution. The principal facts were incorporated in my 'Botanical Looker-Out;' and the *passages quoted* from the *new edition* of that work, *appear also in the first edition of 1842!* So that it does not exactly follow as a logical deduction, that "Mr. McIntosh *cannot* have copied from Mr. Lees," merely because he makes no allusion to the 'Botanical-Looker-Out.' Such things have been; and a friend showed me a London newspaper, with a whole chapter from my book appearing in the guise of an original article. Some "penny-a-liner" had been thus taking the hint of *extracting* my juices after mistletoe fashion! I myself make no accusation against Mr. McIntosh, who may have probably seen my book and forgotten a foot-note about it; or, for the ancient history of the mistletoe he may have consulted the same original sources of information as I did myself; for the Druidical

part of the story has been hashed up from Stukely, Toland, Fosbrooke, and others, over and over again. I must, however, claim "the sick cow" as belonging to me, having received that piece of rustic practice from a sage old farmer, who, however, assured me that no other mistletoe but that of the oak would do! It is perhaps suggestive of some trickery or "pious fraud" on the part of the Druids, that Davies tells us, in his 'Celtic Researches,' that the apple-tree was considered by the Druids the next sacred tree to the oak, and that orchards of it were planted by them in the *vicinity* of their groves of oak. Certainly, as a chance affair, or as an heavenly operation, as mystically given out, an arch-Druid might hunt long enough in a grove of oaks, in the present day, ere he met with the "heaven-descended plant." The farmers of Herefordshire, however, nurse it to such an extent in their orchards, that one might almost imagine they valued it as much as the Druids did.

Mistletoe on the oak may occur here and there less rarely than is generally imagined;* but when the oak is in leaf it is very difficult to observe the plant among its thick umbrage. Since the last edition of my 'Botanical Looker-Out' was put to press, two additional localities have been brought before my notice, and as yet, I believe, unrecorded for the benefit of the botanist. One is at Frampton-upon-Severn, Gloucestershire, where is a fine young oak with mistletoe upon it, seen in the present spring by my friend Professor Buckman, of the Agricultural College, Cirencester. The Rev. Canon Cradock has been also kind enough to inform me of mistletoe upon two oaks in the sequestered and beautiful parish of Tedstone-de-la-Mere, Herefordshire, of which he is incumbent. Both the oaks are comparatively young; and it is remarkable that old trees, such as might almost claim acquaintance with the Druids, are never found with mistletoe upon them in the present day. Tedstone is delightfully situated upon the lofty banks of the celebrated Sapey Brook, and has several claims upon the notice of the naturalist, as well as the impressed stones connected with the legend of St. Catharine's mare and colt. One portion of the parish, interspersed with broken rocks and mossy water-breaks, bears the name of "the Paradise," and it is just such a vicinity as a contemplative man might wish to make a Selborne of. It dovetails into Worcestershire not far from Knightsford's Bridge.

* A writer in the 'Notes and Queries' for June, 1851, says that "the mistletoe may be often found in the counties of Devon and Somerset growing on oaks," but no precise localities are given.

Returning again to the history of the mistletoe in past times, I am inclined to think that a little too much romance has been mixed up with its connexion with the Druids. They doubtless gathered it at particular times; but there is but slender authority for the arch-Druid's golden hook, white bulls, and other amplifications dilated upon by Stukely and other fanciful antiquaries. Indeed, considering the destruction of the Druidical system by the Romans while they occupied the southern part of Britain, it is probable that our popular appreciation of the mistletoe is derived from another source. The plant, it appears, was dedicated to Friga, the Scandinavian Venus, as an emblem of fertility, from its numerous berries; and thus the mythology of the north, brought in by numerous invaders, has left a traditional memory behind of old observances, that in quiet rustic haunts may still smilingly prepare the way for future connubial rites.

Independently of legend and superstition, however, obvious facts in nature make an impression on the popular mind, long retain their hold, and become associated with thought, sentiment, and proverbial lore. The willow, from producing no apparent fruit, became the emblem of barrenness, and elicited only mournful images; while the berry-bearing mistletoe, so obvious, with its white fruit, among the bare boughs of December, was seized upon as denoting abundant fertility in its clusters, even at a denuded season, smilingly honoured accordingly, and made a domestic decoration of the season. In many farm-houses the old mistletoe-bush is carefully retained in its place till the period recurs for its renewal.

EDWIN LEES.

Cedar Terrace, Henwick, Worcester,
October 4, 1851.

P.S.—I ought to remark, that it is of course clear to myself that the ironical suggestion of the acute editor of the ‘Phytologist,’ as to the use of Mr. McIntosh’s MSS. by me, only implied that there had been copying *in some quarter*, without the acknowledgment that every honourable writer usually makes. My own friends are not likely to suspect *me*,—

“Thou canst not say *I* did it,”—

and I only notice the circumstance lest there should seem any ambiguity from my silence.

Writers who, like Mr. McIntosh, come “last in the train” on any old beaten subject, would do well to remember that the mention of

the authorities they have consulted gives at least a show of erudition to their labours, and prevents any suggestion as to pilfering or plagiarism.—*E. L.*

Casual Remarks on Morphology.

By JAMES L. DRUMMOND, M.D., &c., &c.

THAT the theory of morphology is very ingenious, must be admitted, but that it is a true one, may, I think, be equally doubted; and as it is the unquestionable privilege of every one to think and examine for himself, and not be seduced, either by authority or example, to yield his assent to any doctrine, of the integrity of which he is not satisfied, he is at perfect liberty to express his doubts. Acting on this consideration, I submit the following and future observations to the pages of the 'Phytologist.'

The work which I mean to refer to, is the volume on Botany published under the superintendence of the Society for the Diffusion of Useful Knowledge, which, I believe, gives as full an account of the theory as is to be found. At page 59 of that work we find the following passage:—"It may indeed appear ridiculous to assert that the fruit of a peach is nothing but a peach-leaf rolled up and thickened, an apple only the leaves in a similar state, and a grain of wheat a single leaf in a state of degeneration; and yet we expect to be able to set this matter before our readers in so clear a light, as to convince them that such an assertion, although startling, would be very nearly true. This is called the doctrine of morphology."

This certainly does seem extremely ridiculous; but what is the proof of a peach being only a leaf? Why, an assumption that a carpel is nothing more, as "is very easily shewn, not only by its constant tendency to revert to the form of a leaf as is seen in double roses, anemones, ranunculuses, and the like, but more particularly by the double cherry, in whose flowers Nature has written her laws in a language so simple and positive, that none but the wilfully blind can misunderstand them."—P. 60.

Now, it has been well known, from time immemorial, that double flowers are not in a natural, but in an *unnatural* state, produced by culture or accidental circumstances. When, then, in a double Anemone, rose, &c., we find a leaf where a carpel ought naturally to be, nothing is proved beyond the simple fact that it is so found; but *that* leaf cannot be a carpel changed, for it never was a carpel, though it

has usurped the place where, ordinarily, a carpel ought to be; and instead of illustrating or explaining the laws of Nature, its tendency is directly the opposite, by showing how Nature can *deviate* from her laws, or, at least, from her regular economy.

But the great proof of an apple, or any other fruit, being nothing more than a leaf rolled up and thickened, is to be found in the double cherry. "In this plant," says the writer, "the centre of the flower is occupied by a small green leaf stationed in the place of the carpel, and consisting of two sides folded together along with a midrib, which is longer than the leaf itself, and slightly dilated at the summit." It is, again, said, "That the carpel of a cherry is a leaf admits then of no further doubt, and consequently a cherry fruit is nothing whatever but the mature state of the carpel."—P. 61.

That the ripe cherry is the mature state of the carpel, I admit; but it must be a carpel in earnest, a real carpel, such as Nature, in her laws, destined to produce the cherry, and which nothing else *could* produce. But what is in its stead in the double-flowering cherry? "A small green leaf *stationed in its place*," a starveling, an abortion, that is neither leaf nor carpel, and could never produce a cherry, nor anything else, till the end of time. And this is the simple and positive language of Nature's laws! Why, the whole argument is perfectly valueless; it is founded on an *aberration* of Nature's laws, on an unnatural, useless leaflet, instead of a real seed-vessel, and which can go to prove nothing beyond its own degenerate condition.

But admitting that the genuine carpel is only a modified leaf, how is the formation of the cherry to be explained? This is done by comparing the spurious leaf, that *should* be a carpel, with a real one; and then we are told that "it is obvious that the two reflected sides of the leaf answer to the ovary, the midrib to the style, and the dilated summit of the midrib to the stigma."—P. 61. That the small green leaf bears some resemblance to what it naturally should be, there is no doubt, but it is altogether spurious; it is neither ovary, style, nor stigma; it is a morbid caricature of these parts, and, so far as I am capable of seeing, can serve to sustain no theory but such as may be founded on fancy or conjecture. I will say the same of the statement that "the stone of a cherry is the hardened lining of the fruit; it is also the upper stratum of the leaf, which consists of little bladders placed in a different direction from those of the central and lower strata. The pulpy portion of the cherry will then arise from these latter, distended with fluid and altered in colour."—P. 61.

The writer concludes this part of his subject in the following

words :—" That the carpel is a leaf, is thus proved to demonstration ; and as all compound fruits are collections of carpels, as has already been stated, it follows that all fruits, of whatever kind, are modified leaves." I cannot admit that, in all the arguments used, there has been anything adduced bearing even an approach to a demonstrative proof of fruits being modified leaves. I may want sufficient penetration, indeed, but it appears to me that the only thing really demonstrated is the inanity of the theory.

The next step is " to show that ovules, and consequently seeds, are also alterations of leaves. As it appears from what has just been said that ovules grow upon the margins of a carpellary leaf, there will at first sight be a difficulty in reconciling such a function with the well-known fact that leaves do not in general bear anything analogous to ovules." But I can see no proof whatever of ovules growing on the margin of a leaf ; and neither in the description nor figure of the spurious leaflet is mention made, nor an appearance represented, of anything of the kind. I believe that no instance of a leaf producing seeds has ever been seen, and it is a phenomenon so allied to the impossible, that we may presume it never will. The author observes, however, that " in a common Indian plant, called *Bryophyllum*, the leaves are capable of forming young plants in the crenelling of their border." In *Malaxis paludosa* " buds (*i. e.*, bulbs) are constantly formed at the border of the leaves." It is further stated that " it is to buds, or bulbs, that ovules are to be compared ; their integuments are to be considered rudimentary leaves, analogous to the scales of a leaf-bud, and they have actually been seen by Henslow, Engelmann and others in certain cases of malformation."—P. 61.

I cannot see that, in all this, there is the slightest grain either of proof or probability that seeds are " alterations of leaves." From a remote antiquity it has been well known that Nature does not limit the production of plants to seeds ; but though buds are the most frequent substitutes for them, and although buds grow occasionally on leaves, these are new productions, there is no proof whatever of their being alterations of leaves, and they possess properties which the leaves do not ; the leaf dies and is gone, but the life of the bud continues, and, when favourably situated, it will grow into as perfect a plant as a seed would do, and so far the analogy holds good ; but this is no proof whatever of metamorphosis. If I plant a potato in the earth, or any portion of a potato containing an eye or bud, that bud will grow into a perfect plant, producing leaves, flowers, and abundance of seeds ; but the bud (let us call the potato a tuber, an under-

ground stem, or what we please) is a *new* production, endowed with a totally different vital constitution from the *flesh* of the tuber itself. The same may be said of the buds on the leaves of *Bryophyllum*, and of the bulbs formed on the stems of *Dentaria bulbifera*, the tiger-lily, &c.: they are extraneous bodies, not transformations. As to minute leaves having been seen in the place of ovules by Henslow and others, the observation is not of the slightest value, for this occurred only "*in certain cases of malformation.*"

J. L. DRUMMOND.

Belfast, October 11.

Localities of Plants observed by Mr. William Millen near Belfast.

By the Rev. W. M. HIND, M.A.

I HAVE received a communication from my friend Mr. William Millen, of Belfast, of new localities in his neighbourhood for several plants, which, by his permission, I forward for insertion in the 'Phytologist.' Where passages are included between inverted commas, Mr. Millen's letter is quoted.

"Some of the rarer plants which I have recently discovered are:—

"*Rubus saxatilis*, L. Wolf-Hill Glen; at Woodburn Fall, south side of the Glen; Cavehill." These stations are from two to three miles north of a well-known station for the above plant at Colin Glen, a spot peculiarly rich in botanical rarities.

"*Nymphaea alba*, L., and *Nuphar lutea*, Sm. Whitehouse dams.

"*Cochlearia Anglica*, L. Between Belfast and Holywood (Co. Down).

"*Sinapis tenuifolia*, Br., *Silene noctiflora*, L., *Arenaria serpyllifolia*, L., with *Erodium cicutarium*, Sm." Belfast. "On a new piece of road made about four years ago to connect York Street with the terminus of the Belfast and Ballymena Railroad.

"*Arenaria peploides*, L. (*Honckenya peploides*, Ehrh.) On the shore below Holywood (Co. Down), abundant.

"*Radiola Millegrana*, Sm. Kinnegar, Holywood. This thriving and pretty little plant was unknown here until gravel and sand were removed from the Kinnegar to the Holywood Railway. It made its first appearance in the bottom of the gravel-pit. A few tufts were all I could find the first year. Now it has spread, evidently by the help of water in drains; and it is thriving well at some distance from the pit, as well as in it.

"*Malva moschata*, L. (white and pink varieties). Whitehouse.

"*Erodium moschatum*, Sm. The beach at Eden, near Carrickfergus.

"*Medicago falcata*, L." Belfast. The locality noticed above.

"*Lathyrus Aphaca*, L. Belfast and Ballymena Railway, Whitehouse (only two plants).

"*Apium graveolens*, L. On the shore at Eden, near Carrickfergus.

"*Carduus acanthoides*, L., *Artemisia campestris*, L., and *Senecio viscosus*, L." Belfast. The station contiguous to the railway-terminus mentioned above. A specimen of the *Artemisia* is herewith forwarded for identification.

"*Lathræa squamaria*, L. Whitehouse and Castleton.

"*Symphytum officinale*, L., *S. tuberosum*, L., and *Lysimachia Nummularia*, L. Whitehouse; on the banks of a stream from the shore to the Cavehill.

"*Littorella lacustris*, L. Kinnegar, Holywood.

"*Salicornia fruticosa*, L. Holywood. Smith, in his 'English Botany,' thinks it a doubtful and not forthcoming plant. It would be of some importance to have such doubts settled." To accomplish, as far as may be, the desire of my worthy correspondent, I herewith send a few specimens of the plant, which he has placed at my disposal.

"*Stratiotes aloides*, L., *Butomus umbellatus*, L., *Typha latifolia*, L., and *Carex riparia*, Curtis. Whitehouse dams." The *Stratiotes aloides* occurs plentifully in a pond at Springfield, Belfast, constructed about thirty years ago. Perhaps some person in that neighbourhood can state positively whether the plant has been introduced or not. This question is the more important, as the claims of this plant to be considered indigenous are not generally granted.

"*Triticum junceum*, L. On the beach at Eden, near Carrickfergus.

"*Cystopteris fragilis*, Bernh. Woodburn Glen, below the Fall.

"*Botrychium Lunaria*, Sw. Knockagh, near Carrickfergus, north-east end, plentiful.

"*Ophioglossum vulgatum*, L. In meadows, pastures, &c., on mountains near Belfast, to some miles' distance in the Co. Antrim."

W. M. HIND.

Stapenhill, Burton-on-Trent,

October 16, 1851.

Occurrence of Anacharis Alsinastrum, Bab., in Yorkshire.

By WILLIAM FOGGITT, Esq.

I COMMUNICATE, for the information of your readers, the fact of the occurrence of *Anacharis Alsinastrum*, in the greatest abundance, intermingled with *Potamogeton densus*, *perfoliatus*, and other aquatic plants, in a pond close by the river Wiske, at Newsham, near Thirsk. The pond I had only examined once previously; and at that time, where *A. Alsinastrum* now grows, it was covered with the foliage of *Sagittaria sagittifolia*, which may account for its not having been previously noticed in this locality. It is twelve miles from the nearest navigation, so that it cannot by that means have been introduced; and in my mind it is truly indigenous.

WILLIAM FOGGITT.

Thirsk, October 10, 1851.

Reply to the Notice of 'Observations on Natural Systems of Botany' (Phytol. iv. 313). By JAMES L. DRUMMOND, M.D., &c., &c.

As to converting the 'Phytologist' into an arena of controversy, nothing could be further from my wish. I have seldom known controversies do much, if any, good; and, besides, after all the lengthy communication of your correspondent, I believe that the leading arguments of my little book remain untouched. That some parts of the work were written carelessly or thoughtlessly, I acknowledge. There could be no more glaring mistake than that of objecting to the lupin, trefoil and Laburnum being classed together. This was very bad, and yet it would be absurd to imagine that it arose from ignorance, especially when, in the four editions of my 'First Steps to Botany,' these three plants are specified as belonging to the class *Diadelphia*. In my saying that Linnæus would scarcely have joined certain plants in the same group with others which I mentioned, I never thought it necessary to look whether, in his incongruous Fragments, such plants were included in the same order or not, because what I meant was, that he could not so group them on the ground of their closely resembling each other, and in this impression I concluded with the following passage:—"In an artificial system it matters not how incongruous may be the species included in any class or order; but to find such as the above, and hundreds of others, in systems professing to arrange

together such plants as are 'more like to each other than to anything else,' is certainly somewhat of the wonderful."—P. 90. A number of these plants, however, did happen to be arranged together, and this has been made the most of, to prove that I am wholly ignorant of the writings of Linnæus. Well, I have got a good whipping, and will explain my meaning more clearly the next time.

There is another matter, Mr. Editor, of a much more serious nature, and which I greatly regret to have happened; that is, the having quoted a passage of DeCandolle as if it had been Dr. Lindley's, from my having overlooked that it was printed with inverted commas. I had not the slightest suspicion of such a thing having occurred, till I saw it referred to by your correspondent; but I indignantly repel his insinuation that it was done designedly; I would not, for any consideration on earth, have recourse to so low and degrading a piece of trickery.

The long communication in the 'Phytologist,' is a modified edition of the critique which appeared in the 'Westminster Review' for October, 1850, in which I am represented (after being called the "Resurrectionist" of Linnæus, or appearing in that character) as uttering "the most mournful lamentations," with other words of similar import. I was again brought forward by this reviewer in the pages of the 'Phytologist,' under the same grievous aspect, to form an agreeable preamble to his remarks on the last edition of the 'British Flora,' and in consequence I wrote a short letter, stating to your readers that such terms as "*dolorous*," &c., were quite unjustifiable, as applied to my little work.

The reviewer again comes forward with his long communication; and if he had possessed a grain of moral courage, or of manly spirit, he would, at least, have expressed some regret at having held me up to public ridicule through the medium of his own falsehoods. In place of that, he has had recourse to a petty subterfuge, but which is too transparent not to be seen through by the most inattentive reader. He quotes, from different parts of the 'Observations,' the words sorry, fear, and afraid, which he puts in Italics, and says that "they are not perhaps either '*dolorous*' or '*lachrymose*,' in the strict sense of the words." Why, then, did he use these terms? Why did he fraudulently employ them for the purpose of turning the book and its author into contempt, for there could be no other possible object in view than that? But referring to the words he puts in Italics, "they only mean, according to the dictionaries, 'to be grieved,' 'to live in terror,' and 'to be struck with fear; terrified; fearful.'" Now, even

with the help of the dictionary, he cannot show that either "sorry," or "to fear," or "to be afraid," can possibly mean either dolorous or lachrymose; and further, the dictionary meanings he has quoted will not even apply to any of them, as they are located in my book. No dictionary can explain the various shades of meaning attached to a large proportion of the words it contains; and in composition the exact meaning of a word is often to be derived from the context, rather than from the dictionary; and the same may be said of conversation. If I observe, that I am sorry there has been a little rain this morning, does it imply that I am actually grieved, or in grief, about it? If I say, I fear to-morrow will not be a fine day, or I am afraid Parliament will not meet before spring, does it imply that I "live in terror," that I am "struck with fear," or that I am "terrified," or even "fearful?" The writer says that "of all these meanings we give the author the benefit, and admit that he used no '*dolorous terms*,' made no '*lachrymose observations*,' and uttered no '*lamentations*,' as is represented in the '*Phytologist*,' save and except such as we have just cited." This surely requires no comment, and I would not have dwelt so much upon the subject, except to exhibit it as a characteristic specimen of the corrupt spirit of criticism which pervades almost the whole of the long communication.

At page 336 is the following passage:—"The author complains of the '*finesse held out on every occasion to the disparagement of the Linnæan botany*;' *we are afraid* that he has, in more than one instance, laid himself open to the charge of doing the same thing in disparagement of structural botany. For example, at p. 12, by adroitly foisting a parenthetical sentence into a quotation from the Preface to the '*Introduction to Botany*,' he makes Dr. Lindley say that the *natural system* 'teaches the physician how to discover in every region the medicines that are best adapted for the maladies that prevail in it;' &c. Now Dr. Lindley is not here speaking of any particular system, but of the science of botany generally, independently of systems and methods."

No; Dr. Lindley was not speaking of botany generally, but of "botany as now understood," and of its "furnishing a *certain clue*" by which to distinguish the medical properties of plants, which no other *system* than the *natural*, I believe, ever pretended to do.

I will only notice once passage more, in which I am, by this ingenious writer, all but stigmatized as being the fabricator of a deliberate falsehood. "By the way," he says, at p. 336, "we may mention that we are entirely unacquainted with any place '*near London*,' or

anywhere else in England, where *Lolium temulentum* 'is grown in large quantities, probably with the nefarious object of adding to the intoxicating quality of distilled or fermented liquors.'—P. 50. What are the excise-people about?" It is an old and true saying, that, as we lead our lives, we are apt to judge our neighbours; and on such grounds only, I presume, the reviewer has *more* than hinted that I myself forged this notice of the darnel; but I can assure him that I am not a member of his school; and if he will look into the second volume, page 200, of the seventh edition (which, I think, is the last) of Withering's 'Arrangement,' he will find the following:—"The laws of China make it a capital offence to use them" (the seeds of *Lolium temulentum*) "in fermented liquors; and yet, *in the immediate vicinity of London*, this noxious weed *is cultivated by the acre*, and it is to be apprehended for no better purpose."

And this gentleman would condescend so far as to engage with me in controversy! The favour may, indeed, be more flattering than I could expect; but, notwithstanding, I must beg leave, with all due courtesy, to decline the honour.

J. L. DRUMMOND.

Belfast, October 15, 1851.

[Although I cannot approve some of the terms used by Dr. Drummond in this communication, yet a spirit of strict impartiality (for which my editorial management has, and I trust deserves, the credit), and my own invitation on the wrapper of the last number, almost enforce the propriety of printing Dr. Drummond's reply, as I have done, *verbatim et literatim*. The subject must drop here.—*Edward Newman*.]

Proposed Addition of three new Species and three new Genera to our List of British Ferns. By EDWARD NEWMAN.

ATHYRIUM OVATUM, Roth.

FOR the earliest specimen in my possession, I am indebted to Miss Beever, of Coniston, under date of 1842. The frond was one of a number from the Lake district, which that lady most obligingly forwarded when I was engaged on my 'History of British Ferns.' The second specimen which reached me, was from Miss Wright, who found the plant at Keswick, in 1846, and considered it as a species

perfectly distinct from *Filix-femina*. The third was a mutilated fragment, from the same source, in the autumn of the present year. And lastly, seeing a variety of *Filix-femina* mentioned in the recently-published third edition of Babington's Manual, as having been received from Keswick, I applied to that distinguished botanist, and he has most obligingly placed in my hands his specimens, together with some valuable MS. notes.

From a revision of these materials, and a reference to previously-collected data, I have concluded :—

1st. That it is also the *Athyrium ovatum* of Roth, *Flora Germ.* iii. 64 (1800); the description being cited *in extenso*, *Newm. Ferns*, 420.

2nd. That it is the *Athyrium Filix-femina*, var. *dentatum*, *Newm. Ferns*, 243, except as regards the admission of Hoffmann's *Filix-femina* (1844).

3rd. That it is the *Athyrium latifolium* of Presl, *Tent. Pterid.* 98 (1836).

4rd. That it is *Asplenium Filix-femina*, β . *latifolium*, of Hooker and Arnott's 'British Flora,' 574 (1850).

5th. That it is the *Athyrium Filix-femina*, δ . *latifolium*, of Babington's Manual, 413 (1851).

6th. That it is perfectly distinct as a species.

The admirable description of Roth, cited in B. Ferns, leaves nothing to be desired or added. The later descriptions, of course my own included, are insufficient to distinguish this species from its well-known congener.

It is necessary to add, that Roth cites two of Hoffmann's species, *Polypodium dentatum* and *P. Filix-femina*, as identical with *ovatum*; but, whether this be so or not, it is certain that Hoffmann departed from all rule in giving a new species a name already occupied by an old one; and there were both a *Polypodium dentatum* and a *Polypodium Filix-femina* previously in the list.

CYSTOPTERIS DICKEIANA, *Sim.*

This plant is very familiar to all cultivators; it is the least divided form of *Cystopteris* with which I am acquainted, and is instantly distinguished from all those forms known as *fragilis*, by its crowded, scarcely pinnatifid, overlapping, twisted, deflexed pinnæ, and its small, circular, generally naked clusters of capsules. It is easily cultivated, and increases freely, by lateral division of the roots, or from seed, and in either instance retains its characters perfectly.

It was fully described as a species by Mr. Sim, of Foot's Cray, in

'The Gardener's Journal' for 1848; but our publishing botanists—Moore, Hooker & Arnott, and Babington—have subsequently ignored it as a species.

PSEUDATHYRIUM ALPESTRE, *Newm.*

The other novelty is a plant which I propose to consider as the type of a new genus (see below). I believe it is now generally considered an *Athyrium*, and some botanists even contend that it is merely a form of *Filix-femina*. I allude to the *Aspidium alpestre* of Hoppe (*Tasch.* p. 216 (1805)), and of Schkuhr (*Handbuch*, 58); the *Polypodium alpestre* of [Koch, Sadler and others; the *Aspidium rhæticum* of Swartz; and the *Polypodium rhæticum* of Woods, in his lately-published 'Tourists' Flora.' Like the two preceding species, this has been so fully described, that there is no necessity for any addition of mine.

The only specimen I have seen, was gathered by Mr. Watson, in Canlochen Glen, Forfarshire, in 1846, and has been most obligingly placed in my hands by that gentleman.

The similarity of this plant to *Athyrium Filix-femina*, is beyond all doubt; the habit, figure, texture, and the physical properties of the fronds are all but identical; but there is a difference in the fruiting, which is not that of a mere variety or casualty of any kind, and which, if disregarded by the scientific botanist, must disturb all those combinations of groups in which the characters of the fructification have been employed as of primary importance. I am not forgetful that one of our greatest botanists has expressed an opinion at variance with that generally received on this subject; and I trust that I do not, in the least, undervalue an opinion pronounced by such high authority; but I cannot help feeling that, for many years, the fructification of ferns will be regarded as of *primary*, and the outline of frond as of *secondary* importance. Entertaining this view, and seeing that a great number of subdivisions of the Linnean genus *Polypodium* have been created, so to speak, it is all but compulsory to raise to generic rank those other groups of that gigantic family which still remain uncharacterized.

The three new genera are these:—

Genus.—PSEUDATHYRIUM.

Pinn. v. pinnul. venis lateral. ramosis apice liberis, ramo antico capsulifero: soris rotundis, semper distinctis in ram. capsulif. dorso sitis: involucro nullo.

Sp. Ps. alpestre = Pol. alpestre, *Hoppe*, and about fifteen ascertained exotic species.

Genus.—LOPHODIUM.

Pinn. v. pinnul. venis lateral. plus minusve ramosis apice liberis, ramo antico capsulifero : soris rotundis in ram. capsulif. dorso sitis : involucro subcirculari, complanato, obliquo, anticâ elevato, posticâ depresso emarginato adhærenti, marginibus liberis, sinuatis, sæpius glanduliferis : pinnul. lobis ultimis cristatis, i. e. dente vix spinoso armatis.

Sp. Lo. recurvum, Lo. multiflorum, Lo. glandiferum, Lo. spinosum, Lo. uliginosum, Lo. Callipteris, cum multis aliis = Polypodium cristatum, *Linn.*; Aspidium dilatatum, *Sw.*; Asp. spinulosum, *Hook. olim.* Lastreæ species, *Presl, J. Sm., Newm., Bab., non Bory.* There are about sixty exotic species.

The name of Lastrea should never have been applied to species which were neither included by the author, nor comprehended in his description. The cormus, or rhizoma, in this genus is always large, massive, long-enduring, and of slow growth.

Genus.—GYMNOCARPIUM.

Pinn. v. pinnul. venis lateral. plus minusve ramosis apice liberis, ramis omnibus capsuliferis : soris rotundis, primùm distinctis, denique approximatis, contiguis, confluentibus in ramorum dorso sitis : involucro nullo.

Sp. Gy. Phegopteris, Gy. Robertianum, Gy. Dryopteris, &c. = Pol. Phegopteris, &c., *Linn., &c.* Lastreæ species, *Bory, Newm., non Presl, nec J. Sm.* There are about thirty exotic species.

The rhizoma in this genus is simply a stolon, slender, of rapid growth, and extremely perishable. There is no cormus, or even representative of cormus, unless the stolon can be thus considered. The stipes adheres to the stolon, not being articulated thereto, falling off and leaving a scar, as described by myself in Polypodium vulgare.

I need scarcely say, that the numerous announcements crowded into this short communication, have, for their principal object, the suggestion, not the imposition, of change; and that I shall feel deeply indebted for any alteration, correction, modification, or addition that may occur to any of my readers; and, also, that the more prompt, the more acceptable will be such alteration, because I may thus be saved the repetition and extensive diffusion of error in the forthcoming edition of the 'British Ferns,' which is now in the press.

EDWARD NEWMAN.

Botanical Society of London.

Friday, October 3, 1851. John Reynolds, Esq., Treasurer, in the chair.

Mr. G. E. Dennes, the Secretary, stated that the Council had appointed Mr. J. T. Syme Curator, and that the rooms would be open every Monday, Wednesday, and Friday, from ten to five.

The Curator reported that a large collection of duplicates of European plants, mostly those not found in Britain, had been labelled for the Society by Mr. Hewett C. Watson. Lists of the species (amounting to nearly a thousand, and including many of the rarer arctic and South-European plants) will be sent to the members who desire foreign specimens, in order that they may, in rotation, *select their own desiderata*, instead of merely receiving parcels looked out for them by the Curator alone, and thus unavoidably selected without reference to the contents of their own herbaria.

A specimen of *Grammica suaveolens*, *Schultz*, discovered by Mr. E. G. Varenne, growing on lucerne, near Witham, in Essex, in September last, was exhibited. On inquiry, it was ascertained by Mr. Varenne that the field had been sown with imported seeds, and that the dodder had proved very injurious to the crop. The *Grammica suaveolens* is identical with the *Cuscuta Hassiaca*, *Pfeiffer*, of Koch's 'Synopsis Floræ Germanicæ.' It may be readily distinguished from the other dodders found in England, by its pedicellated flowers, bright, orange-yellow stems, and sweet scent.

The conclusion of Mr. Daniel Stock's paper 'On the Botany of Bungay, Suffolk,' was read.—*G. E. D.*

Notice of 'The Botanical Gazette,' No. 33 and 34, September and October, 1851.

The contents of the September number are as under:—

'Botanical Notes of an Excursion through Portugal and Spain; by John Ball, M.R.I.A.'

'Some Remarks on the Plant Morphologically considered; by the Rev. Dr. M'Cosh.'

'Literature:—Contents of 'Annals of Natural History,' Hooker's 'Journal of Botany,' and 'Phytologist.'

Report of the Proceedings of the British Association for the Advancement of Science.

Mr. Ball's paper is only interesting, to the British botanist, as tracing the botanical range of some of our British plants. The author considers the vegetation of Vigo and its vicinity as confirming, in some degree, the hypotheses of those naturalists who believe in the former extension of the Galician coast towards the British Islands, but that the botanical evidence points rather to a connexion with Cornwall and Devon, than to one with Ireland. *Asplenium lanceolatum* occurred at this spot. Only seven or eight species were observed which do not belong to the British flora. The vegetation of Lisbon and Cintra presents a great contrast to that of Vigo; many of the species observed here do not extend north of the Douro, neither do they occur in the Mediterranean flora. At Cintra, remarkable for the fantastic forms of the granitic pinnacles which overhung the village, Mr. Ball was struck by the abundance of fruticose Leguminosæ, and by the presence of ferns which announce that he is approaching the semitropical Atlantic flora. Most of the Leguminosæ, however, were not determined. Among the ferns were *Davallia Canariensis*, *Asplenium palmatum*, *A. Adiantum-nigrum*, var. *Virgilii*, and two others not previously ascertained. One of the peculiarities of this locality is the abundance and luxuriance of *Pelargonium*, two species of which are completely naturalized. At Lisbon and, further on, at Santarem, as well as elsewhere in the valley of the Tagus, the hedges were principally formed of the common *Agave Americana*, planted about three feet apart. On the banks of the Zezere, near the ferry, the author gathered *Lycopodium denticulatum*, which was not observed elsewhere during the excursion. The second part of Mr. Ball's communication is less botanical than the first; and although rendered interesting by geological and physical details, there is but very little information for the exclusively British botanist. I do not mention this as objecting to such writing; on the contrary, I consider it valuable and instructive; but as the Gazette is now reduced to a minimum of size, I am rather jealous of any portion being occupied with matter not perfectly legitimate. I observe that near Zarza, on the Spanish frontier, our traveller, in crossing a chain of rather high hills, on which the track had completely disappeared, had to force his way through thickets of *Arbutus Unedo*, the berries of which were of the size of a large gooseberry, and very palatable.

Dr. M'Cosh's paper has already appeared in these pages.

The report of the British Association is given elsewhere.

The October number contains, in addition :—

‘Notes on a few Species of *Hieracium*; by James Backhouse, Jun.’

‘Occurrence of *Bacillaria paradoxa* of Gmelin at Stafford; by the Rev. R. C. Douglas, M.A.’

‘Note concerning *Anacharis Alsinastrum*; by Charles C. Babington, M.A.’

‘Literature :’—‘*Botanische Zeitung*,’ ‘*Annales des Sciences Naturelles*.’

‘Proceedings of Societies :’—‘British Association for the Advancement of Science,’ ‘Botanical Society of London.’

‘Record of Localities.’

Mr. Backhouse’s paper on *Hieracium* is curt, but excellent. The author observes that, having had an opportunity of examining Norwegian plants of *H. alpinum*, in a growing state, he found the distinguishing characters as strongly marked as on the Scotch mountains : it was dwarf, unbranched, and had lax, blunt, foliaceous outer involucre scales. The variety *melanocephalum* of Fries was distinguished from the type, by its acute involucre scales being all alike in form, and the entire plant having shorter hairs.

H. nigrescens, when living, is marked by dark, appressed involucre scales, broader, less acute leaves, and generally branched stems.

Home specimens of *H. pallidum*, given to the author by Professor Blyth, differ from the Scotch plant, in their more lanceolate, acute, and dentate leaves, and in the smaller size of the entire plant.

H. Dovrense, said by Fries to have been found in Britain, the author considers a good species. The upper leaves are rather cordate and semiamplexicaul, the lower ones narrower at the base, and the root-leaves stalked and blunt.

The Clova *H. saxifragum* is not the normal form of that species, having broader, blunter leaves and larger heads, with darker involucre scales.

H. plumbeum is to be regarded as a truly distinct species, differing from *cæsium* and *murorum* in the absence of stellate pubescence on the involucres and panicles, and in having broadly-acuminate, apiculate, dark involucre scales, with green margins; it also flowers earlier than *cæsium*.

Mr. Babington’s note on *Anacharis Alsinastrum* appears to have been elicited by a note in the September ‘*Phytologist*.’ It is as follows :—

“In order to prevent future mistakes it is desirable to place upon record that this plant was introduced into a tub in the Cambridge

Botanic Garden, in the year 1847, and that in the following summer of 1848, the late Mr. Murray, the Curator of that Garden, planted it in a stream which passes the new garden and supplies the town with water. It has now filled that stream, has found its way down the waste pipe from it into the river Cam, and abounds in that river all about Cambridge, and for at least six miles below the town."

*Notice of Hooker's 'Journal of Botany and Kew Garden Miscellany,'
Nos. 33 and 34, September and October, 1851.*

The papers in the September number are intituled:—

'Florula Hongkongensis: an Enumeration of the Plants collected in the Island of Hong-kong by Capt. J. G. Champion, 95th Reg.; the determinations revised and the new species described by George Bentham, Esq.'

'Sketch of the Vegetation of the Isthmus of Panamá; by M. Berthold Seemann, Naturalist of H.M.S. Herald.'

'Journal of a Voyage from Santarem to the Barra do Rio Nergro; by Richard Spruce, Esq.'

'Contributions to the Botany of Western India; by N. A. Dalzell, Esq., M.A.'

'Botanical Information:—'Mr. Plant's Botanical Journey to South America, &c.' 'Death of Professor Ledebour' at Munich, on the 4th of July.

'Notices of Books:—'Bulletin Physico-mathématique de l'Académie Impériale des Sciences de Saint Petersburg. Comptes rendus Hebdomadaires des Séances de l'Académie des Sciences, Paris, Août, 1851.'

Mr. Bentham's paper contains descriptions of eight new species—*Clematis uncinata*, of the order Ranunculaceæ; *Uvaria microcarpa* and *U. platypetala*, of the order Anonaceæ; *Cyclea deltoidea*, *Hypserpa nitida*, and *Nephroica pubinervis*, of the order Menispermæ; *Capparis pumila*, of the order Capparideæ; and *Viola confusa*, of the order Violaceæ.

The following extract, relating to the poisonous plants of Panamá, is from Mr. Seemann's paper:—

"The most dreaded of the poisonous plants are the Amaucay (*Thevetia neriifolia*, Juss.), Cojon del gato (*Thevetia nitida*, DeCand.), Manzanillo de playa (*Hippomane Mancinella*, Linn.), Florispondio

(*Datura sanguinea*, Ruiz et Pav.), and Bala (*Gliricidia maculata*, Kunth). It is said of the Manzanillo de playa that persons have died from sleeping beneath its shade; and that its milky juice raises blisters on the skin, which are difficult to heal. The first of these statements must be regarded as fabulous, and the second be received with a degree of modification. Some people will bear the juice upon the surface of the body without being in the least affected by it; while others do experience the utmost pain: the difference seeming to depend entirely upon the state of a man's constitution. Great caution, however, is required in protecting the eyes, for if the least drop enters them, loss of sight, and the most acute smarting for several days, are the consequence. The smoke arising from the wood produces a similar effect; and I remember that, while surveying on the coast of Darien, a whole boat's crew of H.M.S. 'Herald' was blinded from having kindled a fire with the branches of this tree. Whenever the natives are affected by the poison they at once wash the injured part in salt water. This remedy is most efficacious, and, as the Manzanillo is always confined to the edge of the ocean, of easy application. It has been stated that the Indians of the Isthmus dip their arrows in the juice of the Manzanilla. There are, however, various reasons for doubting this assertion; firstly, because the poison is, like that of all Euphorbiacæ, extremely volatile, and however virulent when first procured, soon loses its power; secondly, because its effect, even when fresh, is by no means so strong as to cause the death of human beings, it not even producing, as has already been stated, the slightest injury on some constitutions. We may, therefore, consider the statement as an inaccuracy, and rather suppose that the Indians, like those of Guyana, obtain their poison from the *Strychnos toxifera*, *Bth.*, and *S. cogens*, *Bth.*, two plants very common throughout Panamá and Darien. The fruit of the Amaucay (*Thevetia neriifolia*, Juss.) is also considered very poisonous, but its dangerous qualities have probably been over-rated. I knew a gentleman in Panamá who, when a boy, ate four of these fruits, without experiencing any other effect than that of mere griping. The leaves of the Bala, or, as it is called, Madera negra (*Gliricidia maculata*, Kth.), are used to poison rats. The Florispondio (*Datura sanguinea*, Ruiz et Pav.) appears to have played, and still continues to play, a prominent part in the superstition of tropical America. The Indians of Darien, as well as those of Chocò, prepare from its seeds a decoction, which is given to their children to produce a state of excitement in which they are supposed to possess the power of discovering gold. In any place where the

unhappy patients happen to fall down, digging is commenced ; and as the soil nearly everywhere abounds with gold-dust, an amount of more or less value is obtained. In order to counteract the bad effect of the poison, some sour Chicha de Maiz, a beer made of Indian corn, is administered."

M. Seemann dwells with pleasure on those plants of the Isthmus which emit delicious perfumes, and proceeds :—

"The most famous, however, of all the ornamental plants is the *Couroupita odoratissima*, *Seem.*, combining a most delicious fragrance with a splendid flower. In the Morro, a forest near the village of Rio Jesus, are four of these trees, which are considered by the inhabitants as the only ones that exist in the country, and the greatest curiosities Veraquas can boast ; and indeed, I myself have never observed them in any other locality. They form a groupe, and are vernacularly termed Palos de Paraiso (*i. e.*, Paradise trees), or Granadillos, deriving the former name from their beauty, and the latter from the close resemblance which their flowers bear in shape and size to those of the Granadilla (*Passiflora quadrangularis*, Linn.) The trees are from sixty to eighty feet high, and up to an elevation of twenty feet, where the branches diverge, their stems are thickly covered with little sprouts, bearing, from February until May, blossoms, the odour of which is of so delightful and penetrating a nature, that in a favorable breeze it may be perceived at nearly a mile's distance. The flowers are one and a half to two inches in diameter, and their petals are of a beautiful flesh colour with yellow stripes, contrasting charmingly with the golden stamens of the centre. The people of Veraquas, whose apathy is not easily roused by the beauties of Nature, often repair to these trees during the flowering season, in order to behold the bright tints of the blossoms, and enjoy the delicious perfume which they exhale."

The author then gives an agreeable account of the Palo de velas, or Candle-tree, from all the lower branches of which depend long, cylindrical fruits, of a yellow wax-colour, and so much resembling a wax candle as to have given rise to the singularly appropriate name. The candles are sometimes four feet in length, and cattle are remarkably fond of them. The name of this tree is *Parmentiera cereifera*. We have the following account of the Cedron and Vegetable Ivory, two well-known plants, concerning which several extracts have previously appeared in these pages :—

"A tree, which has attained great celebrity, is that called Cedron (*Simaba Cedron*, Planch.) The most ancient record of it which I can find is in the 'History of the Buccaneers,' an old work published

in London, in the year 1699. Its use, as an antidote for snakes, and place of growth, are there distinctly stated; but whether on the authority of the natives, or accidentally discovered by the pirates, does not appear. If the former was the case, they must have learned it while on some of their cruizes on the Magdalena, for in the Isthmus the very existence of the tree was unsuspected until about 1845, when Don Juan de Ansoatigui ascertained, by comparison, that the Cedron of Panamá and Darien was identical with that of Carthagena. The virtues of its seeds, however, were known, years ago, from those fruits imported from the Magdalena, where, according to Mr. William Purdie, the plant grows in profusion about the village of San Pablo. In the Isthmus it is generally found on the outskirts of forests in almost every part of the country, but in greater abundance in Darien and Veraguas, than in Panamá. The natives hold it in high esteem, and always carry a piece of the seed about with them. When a person is bitten, a little, mixed with water, is applied to the wound, and about two grains scraped into brandy, or, in the absence of it, into water, is administered internally. By following this treatment the bites of the most venomous snakes, scorpions, centipedes, and other noxious animals, have been unattended by dangerous consequences. Doses have also proved highly beneficial in cases of intermittent fever. The Cedron is a tree, from twelve to sixteen feet high; its simple trunk is about six inches in diameter, and clothed on the top with long pinnated leaves, which give it the appearance of a palm. Its flowers are greenish, and the fruit resembles very much an unripe peach. Each seed, or cotyledon, I should rather say, is sold in the chemists' shops of Panamá for two or three reals (about 1s. or 1s. 6d. English), and sometimes a much larger price is given for them.

“Highly interesting is the Antà, a species of vegetable ivory (*Phytelphas* sp.) distinct, probably, from that of the Magdalena. It grows in low damp localities, principally on the banks of rivers and rivulets, and is diffused over the southern parts of Darien, and the vicinity of Portobello, districts which are almost throughout the year deluged by torrents of rain, or enveloped in the thick vapour that is constantly arising from the humidity of the soil, and the rankness of the vegetation. It is always found in separate groves, seldom or never intermixed with other trees or bushes, and where even herbs are rarely met with, the ground appearing as if it had been swept. In habit it resembles the Carozo colorado, or Oil Palm (*Elais melanococca*, Gærtn.); so much, indeed, that at first sight the two are easily mistaken for each other. Both affect similar localities, and have

trunks which, after creeping along the ground a few yards, ascend, and attain about an equal height. Their leaves, also, resemble each other; and their fruit grows in a similar way, attached to short peduncles, and almost hidden in the axils. * * * The uses to which the Antà is applied by the Indians are nearly the same as elsewhere. With its leaves their huts are thatched, and the young liquid albumen is eaten. The 'nuts,' however, are turned to no useful purpose. The Spanish Isthmians did not know, before I visited the Isthmus, that vegetable ivory, or Marfil vegetat as they call it, existed in their country; and although they have been told that with the produce of the groves of Darien whole ships might be loaded, no one has yet taken advantage of the discovery."

I will conclude these extracts with the following account of the Jipijapa:—

"An indigenous production deserving especial notice is the Jipijapa (*Carludovica palmata*, R. et Pav.), a palm-like plant, of whose unexpanded leaves the far-famed 'Panamá hats' are plaited. * * * The Jipijapa, or Panamá hats, are principally manufactured in Vera-gaus and Western Panamá: not all, however, known in commerce by that name are plaited in the Isthmus; by far the greater proportion is made in Manta, Monte Christi, and other parts of Ecuador. The hats are worn almost in the whole American continent and the West Indies, and would probably be equally used in Europe, did not their high price, varying from 2 to 150 dollars, prevent their importation. They are distinguished from all others by consisting only of a single piece, and by their lightness and flexibility. They may be rolled up and put into the pocket without injury. In the rainy season they are apt to get black, but by washing them with soap and water, besmearing them with lime-juice or any other acid, and exposing them to the sun, their whiteness is easily restored. So little is known about these hats, that it may not be deemed out of place to insert here a notice of their manufacture. The 'straw' (paja), previous to plaiting, has to go through several processes. The leaves are gathered before they unfold, all their ribs and coarser veins removed, and the rest, without being separated from base of the leaf, is reduced to shreds. After having been put in the sun for a day, and tied into a knot, the straw is immersed into boiling water until it becomes white. It is then hung up in a shady place, and subsequently bleached for two or three days. The straw is now ready for use, and in this state sent to different places, especially to Peru, where the Indians manufacture from it those beautiful cigar-cases, which fetch

sometimes more than £6 apiece. The plaiting of the hats is very troublesome. It commences at the crown and finishes at the brim. They are made on a block, which is placed on the knees, and requires to be constantly pressed with the breast. According to their quality, more or less time is occupied in their completion; the coarser ones may be finished in two or three days, the finest take as many months. The best times for plaiting are the morning hours and the rainy season, when the air is moist; in the middle of the day and in dry clear weather the straw is apt to break, which when the hat is finished is betrayed by knots, and much diminishes the value."

I cannot conclude these interesting extracts from M. Seemann's journals, without expressing my own thanks, and, I trust I may add, those of botanists generally, to this distinguished traveller, for the vast amount of valuable and highly interesting information he has so laboriously collected, and is now so agreeably diffusing. I hope that, before he again leaves Europe on a similar errand, he may complete and publish a connected narrative of his travels and observations. I can scarcely imagine any work more acceptable to the scientific public.

Mr. Dalzell's paper contains descriptions of eight new species: these are:—*Utricularia decipiens* and *U. albo-cærulea*, of the order *Lentibulariæ*; *Eriocaulon rivulare*, *E. odoratum*, *E. cuspidatum*, and *E. pygmæum*, of the order *Eriocaulæ*; *Micropera maculata* and *M. viridiflora*, of the order *Orchideæ-vandæ*.

The papers in the October number are intitled:—

'Catalogue of Mr. Geyer's Collection of Plants gathered in Upper Missouri, the Oregon Territory, and the intervening portion of the Rocky Mountains; by Sir W. J. Hooker, D.C.L., F.R.A. and L.S.'

'*Florula Hongkongensis*: an Enumeration of the Plants collected in the Island of Hong-kong by Capt. J. G. Champion, 95th Reg.; the determinations revised and the new species described by George Bentham, Esq.'

'Figures and Descriptions of two Species of *Boehmeria*, of which the fibre is extensively used in making cloth; by Sir W. J. Hooker, D.C.L., F.R.A. and L.S.'

'Botanical Information:—Advertisements of Algerian plants and Professor Link's microscopes.

Sir W. Hooker's account of plants gathered in the Upper Missouri, &c., contains descriptions of six new species: these are:—*Frasera thyrsoflora*, of the order *Gentianæ*; *Gilia spicata*, *G. iberidifolia*, and

G. trifida, of the order Polemoniaceæ; *Eutoca glandulosa*, of the order Hydrophyllæ; and *Coldenia Nuttallii*, of the order Boragineæ.

Mr. Benthams, in the 'Florula Hongkongensis,' describes nine new species—*Eurya Macartneyi*, *Cleyera dubia*, *Ixionanthus Chinensis*, *Camellia salicifolia*, *C. assimilis* and *C. spectabilis*, of the order Ternstrœmiaceæ; *Garcinia multiflora* and *G. oblongifolia*, of the order Guttiferæ; and *Acer reticulatum*, of the order Acerineæ.

Sir W. Hooker's new species of *Boehmeria* are *B. nivea* and *B. Puya*.

Notice of the 'Annals and Magazine of Natural History,' Nos. 45 and 46, September and October, 1851.

This September contains two botanical articles: these are intitled:—

'Observations on the Affinities of Olacaceæ; by John Miers, Esq., F.R.S., F.L.S.'

'Remarks on Dickieia; by John Ralfs, Esq.'

The former of these is a paper exhibiting the most profound research, and does infinite credit to its talented and most industrious author, whose object is to show that the published opinions of botanists on this hitherto obscure point are not so widely discrepant as they seem. "The family of the Olacaceæ, first proposed by Mirbel, in 1813, under the name of Olacineæ, was placed by him near the Aurantiaceæ: Jussieu stationed it in proximity with the Sapotaceæ, while DeCandolle, following the views of Mirbel, arranged it close to Aurantiaceæ, a conclusion adopted by most succeeding botanists, and among these Endlicher and Meisner, who disposed it with Aurantiaceæ, Meliaceæ, Humiriaceæ, &c., in a class called Hesperides. Brongniart however followed the original views of Mr. Brown, in regard to the affinity of Olax with the Santalaceæ; but, upon less satisfactory grounds, he associated with these the Loranthaceæ, excluding at the same time Ximenia from the family. Dr. Lindley, in his 'Nixus Plantarum' and 'Natural System,' offered a new view, by placing it, under the designation of the Olacaceæ, in the same alliance with the Pittosporaceæ and Vitaceæ, for which position few and not very satisfactory reasons could be offered. Mr. Benthams, in an excellent memoir on the Olacineæ (Linn. Trans. xviii. 676), proposed a new arrangement of the order into three distinct tribes, adding several new genera, together with his ingenious views in regard to its affinities, when he justly denied its relation with the Aurantiaceæ, although he admitted its approach to the Humiriaceæ, considering

both these families to be approximate with the Styracæ; and lastly he allowed, that through *Opilia* and *Cansjera*, the *Olacineæ* evidently osculate with the *Santalaceæ*. Finally, Dr. Lindley (*Veg. Kingd.* p. 43) repeated his former views, with some modifications, placing it in his alliance of the *Berberales*, together with *Droseraceæ*, *Berberidaceæ*, *Vittaceæ*, *Pittosporaceæ*, &c., an alliance which, as Dr. Asa Gray very justly remarks (*Gen. Pl. Un. St. I.* p. 78), ‘is there placed on peculiar grounds by no means compatible with ordinary views of botanical affinity.’”

Mr. Ralfs thus characterizes the genus *Dickieia*, two marine species of which are found on the coast of Britain:—“Frond subgelatinous, tender, plane, containing oblong scattered frustules.” The fronds are so excessively tender that they will not bear removal from the paper on which they are dried, their gelatinous matrix being apparently dissolved by the application of moisture.

The only botanical paper in the October number is intituled—

‘A List of all the Mosses and Hepaticæ hitherto found in Sussex; by William Mitten, A.L.S.’

In this very complete and careful paper three new species are described. *Weissia convolutacea*, *W. longifolia*, *W. aciculata*, and several European species are introduced as British, and for the first time characterized in this country. I cannot too highly commend the labourious zeal of this excellent bryologist, and I think he has selected in the *Annals* the very best channel for the publication of his scientific researches.

Occurrence of Cuscuta Hassiaca, Koch, near Witham, in Essex.

By E. G. VARENNE, Esq.

CUSCUTA HASSIACA, Koch, was found growing upon lucerne, in a field belonging to Mr. Shoobridge, near the town of Witham, in this county, where it was in full flower, about the middle of last September. Mr. Shoobridge states that the crop of lucerne has been greatly injured by the growth of the parasite, and also that the lucerne was raised from seed imported from abroad.

The kindness of Mr. Watson enables me to furnish the readers of the ‘*Phytologist*’ with Koch’s description of *Cuscuta Hassiaca*, a perusal of which will enable such of them as may, by chance, meet with the plant, to recognize it without any difficulty. M. Koch writes as follows:—

“Caule ramoso, floribus fasciculatis pedicellatis, tubo corollæ cam-

panulato limbum æquante squamis convergentibus clauso, limbo 5-fido, laciniis patentibus apice corniculato inflexis, stylis 2, stigmatibus capitato. In Anthemide Cotulâ, Soncho aspero, Galio vero, Medicago sativa, aliisque plantis parasitica. Flores albi, antheris luteis. Caulis læte aurantiacus.”—*Koch, Synopsis, 2nd edit.*

To this description may be added the fact, that the flowers of *Cuscuta Hassiaca* exhale a perfume resembling that of the heliotrope. The odours remain distinctly perceptible in specimens which, for the last five weeks, have been drying in a press.

It does not appear so probable that *Cuscuta Hassiaca* has been entirely overlooked, as that it has been confounded with the *Cuscuta Europæa*, in England. In illustration of this idea, reference may be made to the ‘*Flora Hertfordiensis*,’ p. 192, where the subjoined remarks occur, under the head of *Cuscuta Europæa*:—

“We have heard that a field of lucerne was destroyed by this some twenty years since near Thundridge; but it has not been observed recently.”

In considering the above paragraph, it is as well to be aware that lucerne, in this country, is generally grown from foreign seed; a fact which would almost warrant the supposition that the *Cuscuta* so fatal at Thundridge was imported with the seed of the lucerne sown there. It may not, therefore, be incorrect to attribute the destructive agency at Thundridge, alluded to in the ‘*Flora Hertfordiensis*,’ to *Cuscuta Hassiaca*, rather than to *Cuscuta Europæa*; and the more so, as *Cuscuta Hassiaca* is known to affect lucerne, a partiality not attributed to *Cuscuta Europæa*, which is said to grow on annual or biennial herbs.

It will not be out of place to state that, some years since, when *Cuscuta Trifolii* was forcing itself upon the attention of farmers, as well as of botanists, I observed, during several seasons, a dodder growing upon lucerne, in a small enclosure at Rivenhall, between Kelvedon and Witham. Unfortunately, I did not think of gathering any of this parasite, until the opportunity of doing so was lost. The size and general appearance of the Rivenhall plant were such as to lead to the conviction of its not being *Cuscuta Trifolii*; while, from its growing upon lucerne, it seems very likely that it was the same species as that lately discovered at Witham. At all events, having allowed the opportunity of examining the dodder at Rivenhall to escape, I resolved, in future, to explore all plots of lucerne, in the hope of meeting with something similar again. But lucerne, in cultivation, is not of very common occurrence, and it was some time before I discovered the object of my search. As in this neighbourhood, so

it may be in others ; and, therefore, in all probability *Cuscuta Has-siaca* will be met with elsewhere.

E. G. VARENNE.

Kelvedon, Essex, October, 1851.

Inquiry respecting the Occurrence of Selaginella Helvetica in Britain.

By the Rev. W. W. SPICER, M.A.

CAN any reader of the 'Phytologist' verify or refute the alleged existence of *Selaginella Helvetica* in England in former days ? I was surprised, on looking over Sherard's herbarium, at Oxford, some years ago, to find a specimen of this lycopod among the British Filices. There was no record of locality with it ; but there were five labels, three of which contained references to old botanic authors ; a fourth had the Linnean name, with a reference to Sp. Pl. p. 1568, n. 18, in the handwriting (as Mr. Baxter, who was then Curator, informed me) of Dr. J. Sibthorp. The remaining label was a paragraph, cut out from a copy of the third edition of Ray's Synopsis, at the foot of the 108th page, and is to this effect :—

“Hujus una tantum species adhuc innotuit, nempe *Muscus*, &c. C. B. Quem licet Lobelius Somersetiæ sterilibus montibus, Mendip vocatis, ubi plumbeum effoditur, nonnunquam magnâ copiâ provenire memoriæ proditum reliquerit. Nemo tamen post eum nec ibi nec aliis locis hunc *Muscum* in Angliâ adhuc observavit. Nec loca a Merreto in Pin. p. 80. Memorata huic Musco competunt, sed alii procùl dubio speciei, quam pro hoc perperam habuit. Herbarium sanè ipsius nullum hujus Musci specimen continent.” (The “loca a Merreto memorata” are “damp places at the Neathouses and Kingsbridge, by the Thames' side.”)

I desired Mr. Baxter to inspect other herbaria for me, and he soon after wrote me as follows :—“Besides the Sherardian herbarium, I have examined those also of Morrison, Dillenius, and Dubois, all of which contain specimens of *Lycopodium helveticum* ; but neither of them give any localities for it.” Now the question is, were Lobel and Merret really mistaken, and did the specimens get accidentally into the herbaria of Sherard, &c. ? It seems hardly likely. Neither is it likely that they should all combine to place this particular exotic (if it is one) in the British department of their herbaria. Perhaps a search through other old herbaria, or an examination of some old botanical works, might throw some light on the subject. The dates of the above-named authors are :—Lobel, 1570 ; Merrett, 1667 ; Morrison, 1670 ; Ray, 1724 (3rd edition) ; Sherard (died), 1728 ; Dillenius, 1741. I do not know Dubois' date.

W. W. SPICER.

Itchen Abbas, October 25, 1851.

Development of the Organ of Destructiveness in some Plant-seekers, not Botanists. By WILLIAM BENNETT, Esq.

NEVER having visited the patronymic habitat of *Hymenophyllum Tunbridgense*, and being desirous of inquiring after its welfare, and of ascertaining whether it continued to maintain itself in that locality, we started for Tunbridge Wells one day last week. On gaining the High Rocks, we made at once for the first attractive opening we perceived in them, and after exploring their bases for some time, ascended through one of the characteristic fissures with which that peculiar formation abounds. It was steep and narrow, and but for the advantage of being of somewhat spare habit, our progress towards the top might have been arrested, or the foremost might have found himself in the predicament of a cork in the mouth of a bottle, difficult to be extricated either way. At the upper part of the fissure, an archway or small tunnel is formed by the rocks, through which it was necessary to crawl, or to clamber up an awkward opening on the right, in order to emerge on the summit. I have given this particular description, that every one who has either visited, or may hereafter visit, the spot, may recognize it. By scrambling through the tunnel, instead of climbing up the opening above mentioned, I missed the first discovery of the object of our search. My son, who was my companion, and a head taller, espied something green and suspicious in a hollow of the rock above him, which, on gaining access to, proved to be the *Hymenophyllum*.

We thought ourselves exceedingly fortunate in thus, without any guide or instruction, so soon lighting upon our quarry; and we sat down on a mossy, projecting rock, to gaze upon the home of the beautiful little fern, and to spread out our bread and raisins, before laying our profane hands on a single delicate frond. This, I believe, we should not have done at all; but upon looking round at leisure, we were delighted to observe several other patches, scattered among the crevices, and one on the ground itself. On descending into a lateral fissure, to extend our investigations, I lighted on a loose, dark mass, on a ledge, which, upon examining, to my grief and astonishment, I found to be a large, dead mass of the *Hymenophyllum*, thus ruthlessly torn off the rocks, and left to perish. Another, and another, turned up; and getting down right into the bottom of the great fissure, I found it completely carpeted with the matted rhizoma and withered fronds of the fern, in pieces, some certainly a yard square, thus wan-

tonly consigned to destruction. It was quite clear, that this portion of the rocks had once been entirely clothed with the most luxuriant tapestry of this delicate little fern; that it had been wilfully torn down and destroyed by wholesale, by some Goth or Vandal; and that all we had seen were the mere wrecks and fringes, that had escaped his ruthless hand. We thought we could trace the very fitting of some of the pieces on some parts of the rocks. The attempt, we believe, had been to annihilate the fern entirely; but, thanks to the energies of Nature, it had so far failed, that, besides the scattered fragments here and there surviving, a few small patches had evidently sprung up since; and on a very close inspection, we observed a fair sprinkling of the seedling fern in various spots on the face of the rock, where it had been denuded, again beginning to vegetate; and if unmolested, we have little doubt, in a few years, it will all be green again. At what period this devastation was committed, we were unable to conjecture, not knowing how long the fronds of this fern will continue to maintain some greenness in sufficiently damp situations. At the margins of some of the larger masses, were still a few partially green fronds. We spent half an hour to an hour in carefully replanting all we could find of these in the crevices, hollows, and other likely places, in case of there being any life left. I can hardly desire that such a ruthless barbarian as he whose agency had here been exemplified may be among the readers of the 'Phytologist;' but should this meet his eye, I trust the consciousness and chance of exposure may inflict some punishment, or, at least, the shame and indignity of being thus made to "point a moral;" and, he may depend upon it, he cannot escape his due at some time.

We afterwards observed the *Hymenophyllum* sparingly on the face of a great rock close by the side of one of the made footpaths, and in two places on the Eridge Rocks. We had not time to investigate Harrison's Rocks, but have little doubt the fern is to be found in other stations all over the series, wherever the conditions are presented. Our observation of this day would lead us to the conclusion, that *H. Tunbridgense* does not affect particularly dripping or very wet rocks; and we should have missed it altogether, had we confined our search to the bases of the rocks, as it grows at Ardingly, or like its congener, *H. Wilsoni*, which delights in mountain streamlets, cascades, and the sides of absolutely wet rocks. All the spots where we observed the *H. Tunbridgense* were on comparatively dry parts of the rocks; but a moist surrounding atmosphere is undoubtedly most essential. I am

now inclined to think that we lost a very fine mass of *H. Tunbridgense* we had growing under glass, from having kept it too constantly wet.

W. BENNETT.

Brockham Lodge, Nov 7, 1851.

Professor Nees von Esenbeck.

THE political reaction now in full swing on the Continent is not to pass away without selecting some victims from the ranks of the representatives of botanical science, as it has done from those of other branches of learning. M. Nees von Esenbeck, for having expressed too freely, it was thought, his political conviction, has been deprived of his situation as Professor in the University of Breslau, and is now reduced to the painful necessity of disposing of both his library and herbarium. British naturalists may wonder how scientific men abroad can be so senseless as to join in political demonstrations, and may be at a loss to account for the fact, that a sober man like Stephen Endlicher could be so sanguine as to take the regalia of the Old Germanic Empire from the Museum of Vienna to the revolutionary Parliament in Frankfort. They may have thought that that savan would have acted more rationally if, instead of heading political deputations, he had finished the Supplements to his '*Genera Plantarum*,' or quietly pursued those philological studies by which, no less than by his labours in other branches of learning, he had obtained a well-merited celebrity. Perhaps it would have been wiser had he followed the latter course; but we must not forget that, in the present state of the Continent, it is difficult to observe neutrality, and that men of science, from their superior education, feel too keenly the despotic yoke oppressing their nation to remain indifferent spectators. Who knows, if England did not possess the liberties it does, whether some of our learned might not be induced to play the same parts which some of them now censure in their colleagues across the water?

We must therefore deal lightly with M. Nees von Esenbeck for committing the blunder, if blunder it is, of mixing in politics, and merely keep in view the botanist who, by his learning, erudition, and sound philosophical reasoning, has elucidated the most perplexing of natural orders, and whose literary career has been a succession of brilliant achievements and important discoveries, making it the more painful that the labours of such a man should be cut short by the sale

of his books and herbarium. M. Nees von Esenbeck has just published a catalogue of his library, and prefaced it by an appeal to the members of the Imperial L. C. Academy, and scientific men in general, an extract of which has, by the desire of the author, been communicated to the editors of botanical journals in England, by M. Berthold Seemann. "I am," says the President, "without property; my library, my herbarium, is all I possess, all I am able to leave to my family. In my career as medical man I considered the interest of the poor sufferer of primary, my own of secondary importance, and being devoted too much to scientific studies, I did not obtain a good, certainly never an extensive practice. An estate, inherited from a relative, afforded for some years means and leisure of cultivating science successfully, until, during the French wars, the property became untenable, and I was induced to accept a Professorship in Erlangen, and the Presidency of the Imperial L. C. Academy of Naturalists. Having afterwards, by exchanging Erlangen for Bonn, settled in Prussia, it became a question whether the Academy should have its seat in Bavaria, because my predecessor resided in Erlangen when the German Empire was dissolved, or whether it should retain its position as a national institution of the whole of Germany. The negotiations which followed ended with the Academy keeping its independence, and, as far as circumstances would permit, its position towards the Confederation,—and it was by my exertions that the institution obtained a confirmation of its ancient statutes, and, during its stay in Prussia, an annual grant of 1200 thalers.

"Since 1818 I have laboured in restoring this ancient institution, and in discharging my duties as Professor in the University; indeed my academical duties required my whole attention, and prevented me from accepting any of the more lucrative places which from time to time became vacant. Thus, it happens that, since the Government has deprived me of the Professorship, I am reduced to circumstances which force me to part with my library and herbarium. Having no prospect of a pension, and no desire to solicit favour in high places, I address myself to the members of the Academy, and to my friends and contemporaries, begging them to exert themselves in trying to dispose of my collection. If my library and herbarium could be sold as a whole, I should be able to realize their value, and I would always consider that amount as an acknowledgement of thirty-three years of academical service. — NEES VON ESENBECK, President of the Imperial L. C. Academy of Naturalists."

The herbarium consists of 297 volumes in folio, and 42 in quarto,

and contains altogether 80,000 sheets. It is valuable, on account of its being chiefly composed of exotic specimens, including plants collected by Sieber, Preiss, Wallich, Wight, Ecklon, Zeyher, Drège, Poppe, Wied, and others, and representing most fully the floras of New Holland, Southern Africa, Mexico, the East Indies, and Europe. What renders it still more important is its containing the original specimens on which M. von Esenbeck's monographic labours, his dissertations on the Laurineæ, Solaneæ, Acanthaceæ, Hepaticæ, Astereæ, Cyperaceæ, Gramineæ, and Restiaceæ, are founded.

The library is composed of 3002 volumes, embracing the standard works of natural history and natural philosophy. It is to be sold in Breslau, on the 1st of May, 1852, by public auction, and commissions will be received by the "Schlettersche Buchhandlung" in Breslau, or by any other great bookseller on the Continent. The herbarium, if it cannot be sold as a whole, is to be disposed of in sets. It has been valued at 12,000 thalers, but there can be no doubt that it will fetch a much higher price. The Laurineæ are valued at 280 thalers, the Acanthaceæ at 600, and the Glumaceæ at 3000.

It is to be hoped that these treasures will not be dispersed, but that some institution or private individual, ready to make them available to the scientific public, will become the purchaser, that, after party squabbles have been forgotten, posterity may behold the entire collections of a man whom the present age justly considers one of the most eminent of which science can boast.

P. V. P.

Microscopical Society of London.

October 22, 1851.—A paper was read by Geo. Shadbolt, Esq., 'On the Sporangia of some of the Filamentous Freshwater Algæ.'

This was in continuation of a subject introduced to the notice of the Society in May last, by the same gentleman, when he pointed out the fact, that in *Zygnema quadratum* and *Z. varians* the sporangia undergo a considerable change of form, assuming a stellate character after the lapse of some weeks from their first formation. The second paper detailed observations confirming those previously announced, and giving some of the particulars of the *modus operandi*, and added *Lyngbya floccosa* and a species of *Vesiculifera* to the list of those in which the author had noted an analogous transformation. It was stated that in *Zygnema varians*, after conjugation, when the sporau-

gium appears as an ellipsoidal homogeneous mass, the first change which takes place is the formation of a few semi-transparent vesicles just within the sporangium; and these continually increase in number until the whole interior becomes similarly converted. After about a fortnight's interval from this period, a further change occurs, the sporangia being covered with long, projecting spines, producing a considerable inflation of the original cell-wall of the frond in which they were formed; a fact which the author considers important, as tending to prove the continued existence of vitality in the cell at this stage. It was stated that in *Lyngbya floccosa* the spines are exceedingly short; but, what is remarkable, they are disposed in a regular, spiral line about the long axis of the sporangium. In *Vesiculifera* — ? the spines are numerous and extraordinarily delicate. In all the above-named species, the observations were made while the sporangia were still within the original frond, so that there is no doubt as to which each belonged.—*J. W.*

*Notice of Hooker's 'Journal of Botany and Kew Garden Miscellany,'
No. 35, November, 1851.*

The papers in this number are intituled :—

‘On some Facts tending to show the probability of the Conversion of Asci into Spores in certain Fungi; by the Rev. M. J. Berkeley, M.A., F.L.S., and C. E. Broome, Esq., M.A.’

‘*Angiopteris longifolia*, *Grev. & Hook.*, of Sir William Jackson Hooker's Herbarium, and its Synonyms; communicated by Dr. W. H. Vriese, Professor of Botany in the Royal University at Leyden.’

‘*Florula Hongkongensis*: an Enumeration of the Plants collected in the Island of Hong-kong by Capt. J. G. Champion, 95th Reg.; the determinations revised and the new species described by George Bentham, Esq.’

‘*Journal of a Voyage from Santarem to the Barra do Rio Negro*; by Richard Spruce, Esq.’

‘Contributions to the Botany of Western India; by N. A. Dalzell, Esq., M.A.’

‘Botanical Information:’—‘Letter on the successful Cultivation of *Victoria regia* in Philadelphia, U. S. A., addressed to Sir W. J. Hooker by Caleb Cope, Esq.’

‘Notices of Books:’—‘Papers and Proceedings of the Royal

Society of Van Diemen's Land. Vol. I. 1850. 8vo. Hobart Town, V. D. L.'

'Lehmann: Novarum et minus cognitarum stirpium Pugillus nonus addita nova Recensione nec non enumeratione specierum omnium generis Potentillarum earumque Synonyma locupletissima; Auctore Christiano Lehmann. Hamburgi: 1851.'

In Mr. Bentham's paper eleven new species are described—*Sclerostylis buxifolia*, *S. venosa*, and *S. Hindsii*, of the order Aurantiaceæ; *Xanthoxylum cuspidatum*, *X. lentiscifolium*, *X. pteleæfolium*, and *Boymia glabrifolia*, of the order Rutaceæ; *Evonymus longifolius*, *E. laxiflorus*, *E. hederaceus*, and *Celastrus Hindsii*, of the order Celastrineæ.

In Mr. Dalzell's paper six new species are described—*Sarcanthus peninsularis*, *Eulophia bicolor*, *Habenaria uniflora*, *Peristylus elatus*, and *Dendrobium microchilos*, of the order Orchideæ Vandæ; *Argostemma glaberrimum*, of the order Rubiaceæ; also a new genus, called *Tapinocarpus*, allied to *Arum* and *Dracunculus*, but no type is given or new species described; this is probably reserved for another number.

The following extract from Mr. Spruce's journal is amusing:—

"The Seringue-tree has long been known to exist abundantly on the Rio Madeira, but it is only during the present year that it has been found to grow on the Ramos in considerable quantity. About two months before our visit three small seringals had been opened a little higher up than the mouth of the Mané, and late on the evening of the 17th of November we reached one of these, belonging to Capitaô Pedro de Macedo of Saracà (or Silves, as it is called on the maps). A considerable opening had been made in the forest to erect the necessary huts, and to plant a few cabbages and water-melons. * * * We found the Capitaô a very hospitable and intelligent man, and were glad to accept his invitation to join him at supper and breakfast on game caught near his seringal, including Porco do mato, Macaco barrigudo, and Mutún—the last a bird much resembling a turkey, good eating but rather dry; the monkey is rather insipid and the pig very savoury, though with a thick tough skin. After breakfast he accompanied us into the forest, and showed us the Seringue-trees, and the mode of collecting the milk. A track had been cut to each tree, as also to adjacent flats of Urucurí palm (*Cocos coronata*, Mart.), which, curiously enough, is almost invariably found along with the Seringue, and whose fruit is considered essential to the proper preparation of India rubber. A stout sipó is wound round the trunk of the Seringue, beginning at the base and extending upwards about as high

as a man can reach, and making in this space two or three turns. This sipó supports a narrow channel made of clay, down which the milk flows as it issues from the wounded trunk, and is received into a small cúa deposited at the base. Early in the morning a man goes into the forest and visits in succession every tree, taking with him a terçado and a large cúa (called *cuyamboca*) suspended by a handle so as to form a sort of pail. With his terçado he makes sundry slight gashes in the bark of each tree, and returning to the same in the space of about an hour, he finds a quantity of milk in the cúa at the base, which he transfers to his *cuyamboca*. The milk being collected and placed in a large shallow earthenware pan, several large *caraipé*-pots with narrow mouths are nearly filled with the fruit of the *Urucurí* and placed on brisk fires. The smoke arising from the heated *Urucurí* is very dense, and as each successive coat is applied to the mould (which is done by pouring the milk over it, and not by dipping it into the milk), the operator holds it in the smoke, which hardens the milk in a few moments. The moulds now used are all of wood, and not of clay as formerly, and the one generally preferred is in the form of the *battledores* which English housewives use for folding linen, only thinner and flat on both sides, and the milk is applied only as far as to the insertion of the handle, the latter being held by the operator. When the requisite number of coatings have been applied and time has been allowed for the whole to stiffen, the *Serinque* is withdrawn from the mould by slitting it along one side and end. In this state it is known in the *Pará* market as ‘*Serinque em couro*,’ or hides of India rubber, and it is preferred to the bottle rubber by purchasers. I send you one such ‘hide,’ from which you will see that *Capitão Pedro*’s manufacture is not despicable. If the bottle-moulds are used, or if a shoe is to be moulded on a last, a stick of two feet long is always inserted into the mould to guarantee the operator’s hand from the milk and smoke. Some shoes we saw here had thirty coatings apiece of *Serinque*. The *Capitão* was getting about six milreis an arroba (32 lbs) for his *Serinque*, but in *Pará* it sells for as much as ten milreis. November is the season of ripe fruit of the *Serinque*, but the trees on the *Ramos* had been completely stripped by the *Arâras*, a sort of long-tailed parrot.”

THE
PHYTOLOGIST:
A
POPULAR
BOTANICAL MISCELLANY,

CONDUCTED BY
EDWARD NEWMAN, F.L.S., Z.S., &c., &c.

VOLUME THE FOURTH.
(CONTINUED).



LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

M.DCCC.LII.

There he arriving round about doth fly
From bed to bed, from one to other border,
And takes survey, with curious busy eye,
Of every flower and herb there set in order.
Now this, now that, he tasteth tenderly ;
Yet none of them he rudely doth disorder,
Ne with his feet their silken leaves deface,
But pastures on the pleasures of each place.

SPENCER.

P R E F A C E.

WHEN addressing the readers of the 'Phytologist' at the close of last year, I took occasion to congratulate the botanists of this country on the extent and variety of their periodical literature. At that time every little coterie of botanists seemed to possess its exclusive organ for interchange of sentiment among its members. While penning my observations,—while commending the industry and disinterested love of science which prompted and maintained so goodly an array of journals,—I little thought that some of them had already ceased to exist, and that others had practically, if not theoretically, excluded botany from their pages. It is worthy of notice, as indicating the restricted circulation of these journals, that no appreciable difference in the sale of the 'Phytologist' occurred, either on their commencement or their cessation. It must not, however, for a moment be supposed that I am undervaluing these journals: they contained a number of papers not only of interest, but of value; and right glad should I have been to have inserted them in these pages. I am persuaded it would be regarded as a great boon by the reading and purchasing botanists of Great Britain, if the working and publishing botanists would henceforth confine their contributions to this journal, because then a moderate subscription would put the readers in possession of the current information of the day. I consider the present time, when there can scarcely be said to be any competing journal, the most suitable one for making these observations; and I trust that their propriety will be admitted by every subscriber to the 'Phytologist.' The increase in the number of contributors and of contributions, during the current year, is very marked, and indicates a movement in the desired direction.

I have again to extend a friendly caution against useless repetitions, which not only occupy space unprofitably, but exclude matter of more value. Great caution should be exercised in ascertaining whether a previous record exists of any recently observed fact. It is not that the recent observation must in all cases be suppressed; but, supposing the prior record to exist, it must never be given as new. Thus, it may be a matter of considerable interest to know that *Cucubalus*, *Asparagus*, *Pæonia*, *Lobelia urens*, &c., continue to maintain their old stations; but it would be completely inexcusable to communicate those stations as possessing any novelty. This very observation is a repetition, but a repetition which is called for by the circumstances of the case.

The very copious table of contents which immediately follows will, it is hoped, be accepted, for the present, in lieu of the summary usually given in the Preface. It is not intended to dispense altogether with this summary, although the time and mode of its appearance is still unfixed. I would, however, invite attention to the recent discoveries in that limited field which I have more particularly endeavoured to cultivate. *Pseudathyrium alpestre* has been found in profusion in the Highlands of Scotland; *Asplenium germanicum* in Cumberland and Caenarvonshire; both the *Woodsias* again in Caenarvonshire, and with a considerably extended range; *Trichomanes speciosum* in two new Irish habitats; and last, but not least, *Asplenium Halleri*, the *A. fontanum* of our books, has occurred, in some plenty, on a stone wall in a county where its discovery would never have been anticipated. On these subjects I am not permitted to say more; but I do not doubt that the early numbers of next year will contain every particular.

EDWARD NEWMAN.

9, Devonshire St., Bishopsgate,
November, 1852.

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THE PHYTOLOGIST

FOR 1852.

Biographical Sketches of Dr. C. F. Ecklon and M. C. L. P. Zeyher.
By M. BERTHOLD SEEMANN, Naturalist to H.M.S. 'Herald.'

IN an age like the present, when the personal history of those who have distinguished themselves in the advancement of the arts, or extended the boundaries of science, is thought indispensable in order to form a due estimate of their labours, any authentic information relative to the life of such men must be welcome. I have therefore no hesitation in giving publicity to a few notes respecting two individuals, whose names are for ever identified with the Flora of Southern Africa.

C. F. ECKLON.

Christian Frederick Ecklon was born on the 17th of December, 1795, in Apenrade, Duchy of Schleswig. Dr. Neuber, a physician of some reputation, undertook his education, and also instructed him in botany. The latter became his favourite science, and, having become an apothecary, he had ample opportunity of cultivating it successfully. In October, 1823, he went to the Cape of Good Hope, where he had been engaged as assistant. He occupied the post four years, and took advantage of the position, by exploring the flora of the neighbourhood. The more he studied the productions of that region the more his fondness for them increased; and at last he determined to abandon his original profession, and devote himself entirely to natural history.

The resolution was carried into effect. In 1828 he returned to Europe, and placed his collections in the hands of Danish and German botanists, who described the greater portion in different volumes of the 'Linnæa.' The success with which his endeavours had been attended prompted him to make preparations for a second voyage. Several circumstances favoured this plan. Professors Hornemann and Reinhardt, who had always taken a lively interest in his pursuits, now

used their influence, and succeeded in obtaining for him an annual grant of money from the Danish Government; the Reiseverein at Erlangen also stepped forward; and, aided by these means, Ecklon was enabled to carry out his exploration on a large scale. Having returned to South Africa, he visited the vicinity of Cape Town in every direction, and undertook a journey to Kaffraria. After the completion of the latter he entered into partnership with M. C. Zeyher, went, in company with that botanist, once more to Kaffirland, and repaired, in 1832, with their joint collections, to Hamburg, where he was employed several years in distributing the specimens (the botanical alone amounting to 8000 species), and superintending the publication of Ecklon and Zeyher's '*Enumeratio Pl. Afric.*' In 1838 he returned to the Cape, and shortly after separated from M. Zeyher. He, however, continued collecting, and in 1844 paid another visit to Europe, staid a few months, and in the same year came back to his adopted country, where he has remained ever since.

Ecklon is the author of several works. As early as 1827 he published a dissertation on the *Ensatae* and *Coronariae*, and in 1833, in conjunction with M. Zeyher, the well-known *Enumeratio*, a work, unfortunately, not brought to a conclusion. He has, besides, written various memoirs, which from time to time have appeared in European and Southern-African periodicals; he is a member of several learned societies, and received, in 1838, from the University of Kiel, in consideration of his eminent services in the field of science, the degree of Doctor of Philosophy.

C. L. P. ZEYHER.

Charles Ludwig Philip Zeyher, the eldest son of Jacob Zeyher, was born at Dillenberg, Germany, on the 2nd of August, 1799. After completing the usual course of elementary education he was sent, in 1816, to the grand ducal gardens at Schwetzingen, which at that time were under the direction of his uncle, the well-known landscape gardener.* He remained at that place seven years, acquiring a knowledge of gardening and botany; and he would, probably, ere long have become Court-gardener (*Hof-gärtner*) to Prince Wied-Runkel, which post had previously been filled both by his father and grandfather, had not his desire to travel and explore foreign countries given a different direction to his life. Dr. F. Sieber, who made his acquaint-

* At present this post is filled by M. Theodor Hartweg, formerly Collector of the Horticultural Society of London.

ance, proposed to him to join the enterprize in which he was about to embark. A mutual agreement was soon established, and both left their native country in August, 1822, for Mauritius. They remained in that island upwards of six months, exploring a vegetation depicted in such glowing colours by the immortal pen of St. Pierre, and accumulating a vast amount of plants and other objects of natural history. After the expiration of that time it was thought advisable to separate, without, however, severing their partnership. Sieber embarked for New Holland, Zeyher for the Cape of Good Hope.

Sieber, after a lapse of eighteen months, returned from Australia to Europe. Touching at the Cape, he had an interview with Zeyher, and took charge of the collections which the latter, during his stay in Southern Africa, had formed. He then continued his voyage, leaving his partner behind to carry on his researches, and promising to send the necessary funds for prosecuting them. Zeyher remained true to his engagements: but in vain did he look for remittances; none arrived. All his money had been expended in making collections, and, being unable to wait any longer, he was for a time compelled to enter a family as private tutor. There are now no means of explaining Sieber's conduct; but it is not unlikely political troubles prevented him from fulfilling his duty. After his return Sieber disapproved, in terms offensive to the Austrian Government, of the despotism oppressing Germany. He was consequently looked upon as an obnoxious individual, proscribed and hunted through the different states, till, at last, God, having more mercy than man, called him to a place where no earthly power could any longer disturb him.

After a reasonable time had elapsed, and no remittances had been received, Zeyher considered himself free from all engagements. He began to collect on his own account, and made, in 1825, a journey to the eastern, and in 1828 another to the western, parts (Namaqualand) of Southern Africa. The collection was sent to his uncle, in Schwetzingen, who sold a portion of it. By far the greater number of specimens, however, remained, and were, on the sudden death of that gentleman, taken possession of by the Baden Government, sealed up, and have continued in that state ever since. In 1829 M. Zeyher entered into partnership with Dr. Ecklon, and travelled in his company to Kaffraria. At the end of this journey Dr. Ecklon went with the collections to Europe, to dispose of them to the best advantage.

Ecklon and Zeyher dissolved their partnership in 1838, and during 1840, 1841, and 1842 the latter undertook, accompanied by Mr. James Burke, a journey for the Earl of Derby, an interesting account of

which will be found in Hooker's 'London Journal of Botany.' In 1843 Zeyher visited a second time Namaqualand, which occupied him a year; he then departed for England, and after a stay of nearly eight months at Kew, where he arranged his collections, visited his native country and several other continental states. In 1847 he returned to Southern Africa, and has ever since been residing in Cape Town, holding, from 1849 until March, 1851, the office of Botanist of the Botanic Gardens at that place.

Zeyher, in conjunction with Ecklon, is the author of the 'Enumeratio Pl. Afric.,' and has published, besides, both in English and German, different botanical memoirs. What he has done as a collector has been so often acknowledged, that it would be a mere idle panegyric were here an attempt made to enlarge upon it.

BERTHOLD SEEMANN.

Kew, December, 1851.

Note on Narcissus poeticus. By the REV. W. T. BREE, M.A.

WHEN recording the fact of *Narcissus poeticus* occurring in great abundance in a field in the parish of Fillongley (Phytol. iii. 945), I stated that the plant was "confined to that one field, with the exception, however, of one or two small patches in the orchard, which nobody would take to be wild." Since that notice was printed, I have ascertained that there is another field near Fillongley where the *Narcissus* also abounds. This second field adjoins a farm-house called Black Hall, which is about half a mile north-west of the village. I visited the spot the end of last May, and found the *Narcissus* in plenty, though by no means in the same profusion as in the "lily field" at Blaber's Hall.* Here, at Black Hall, it grows chiefly in two large, dense beds, on a slope of ground, with a few small patches scattered here and there in other parts of the same field. Now, the occurrence of the *Narcissus* in a *second* locality in the same neighbourhood may seem, perhaps, to give some countenance to the notion of its being a true native. I am bound to state, however, that all the same suspicious circumstances which (as I have stated) accompany the plant at Blaber's Hall, attach to it also in this second locality at

* The proper name of the place, which in my former communication I called "Glaber's" or "Glaver's Hall," I have since ascertained, from the agent for the property, is "Blaber's Hall."

Black Hall, in an equal, or perhaps greater, degree. First, the field in which it grows is adjoining to a modern farm-house, built on the site of a more ancient edifice, dignified by the title of "Hall," and bearing evidence of having once been a place of more importance than it may now seem to be. The present occupier informs me that there once was a fish-pond just below the slope on which the Narcissus grew, which has been filled up. Secondly, the plant is confined to one field, and is not found in other suitable spots hard by. And thirdly, as at Blaber's Hall, so also at Black Hall, very many of the Narcissuses produce double or semi-double blossoms. Admitting, however, for argument's sake, that the Narcissus is not a true native in the above situations, but merely the lingering remnant of former cultivation, it still is remarkable, not so much that it should have survived the wreck of the garden, in which, we may suppose, it once was fostered with care, but that it should thrive, as it does, under present neglect, and should have increased to the extent we now find it. I am informed that a former occupier of Blaber's Hall was at some pains to destroy the Narcissuses, under the idea that they were injurious to his grass crop. Certain it is that large quantities of the roots are dug up and taken away year after year by visitors, for the purpose of ornamenting their gardens. Still, however, the roots purloined are not at all missed; and the Narcissuses thrive in profusion, as I have described, in such profusion as they are never seen to do in a modern garden. I may add that the "lily field" last season exhibited its usual magnificent display of blossoms at the end of May, much to the admiration, and even astonishment, of a party of friends whom I took to view it.

W. T. BREE.

Allesley Rectory, Nov. 20, 1851.

Note on Adonis autumnalis. By the REV. W. T. BREE, M.A.

PLANTS which occur scarcely anywhere else than in corn-fields are regarded, I suppose, as making out but a doubtful claim to the character of original natives. Such is the case with *Adonis autumnalis*, the brilliant pheasant's-eye of our gardens. In Turner and Dillwyn's 'Botanist's Guide' eight localities only are mentioned for the plant, and nearly all of these are corn-fields. Whether introduced or indigenous, however, the plant is rare in a wild state; and as I never happen to have met with it till lately, perhaps a note on the subject may,

without impropriety, be admitted into the 'Phytologist.' Being on a visit in Wiltshire in September, I found many specimens of the Adonis in a cultivated field, far away from house or garden, in the parish of Durnford. The field, which, like the rest of the parish, is on the chalk, had apparently been sown with rape, or some such crop, and closely eaten down by sheep in the earlier part of the season. The Adonis had either survived the depasturing of the sheep, or, perhaps, might have sprung up after their removal. I only observed the plant in this one field. Had it been introduced among agricultural seeds—or is it to be considered a true native? The plant is, at any rate, an *old* inhabitant of our corn-fields. Parkinson ('Paradisus,' 293) says "it groweth wilde in the corn-fields in many places of our own country;" and "where it groweth wilde, they call it red Maythes, as they call the Mayweede white Maythes; and some of our English gentlewomen call it Rose rubie."

W. T. BREE.

Allesley Rectory, Nov. 20, 1851.

Note on Dr. Drummond's Reply to the Notice of 'Observations on Natural Systems of Botany' (Phytol. iv. 365). By H. F. HANCE, LL.D.

SIR,—I have just read a reply, by Dr. Drummond, at page 365 of the present volume of the 'Phytologist,' to a review of his 'Observations on Natural Systems of Botany,' which appeared in a former number, and which the Doctor unhesitatingly ascribes to the writer of a critique on the same work in the 'Westminster Review' for October, 1850, of which he declares it to be a modified edition.

As author of the critique in question, with the exception of a few notes and a concluding portion, all of which are distinguished by the initial "L.," I feel I shall not appeal in vain to your impartiality and sense of justice to be allowed, through your pages, to correct this error, and to state that I am entirely ignorant to whose pen the notice in the 'Phytologist,' of which Dr. Drummond complains, is due.

Authors can, perhaps, hardly be expected to feel satisfied with unfavourable judgments of their literary bantlings, and Dr. Drummond expresses a belief that the leading arguments of his little book remain untouched. Both it and the criticism in the 'Westminster Review' have been sufficiently long before the public to make the merits of

the case known to scientific readers ; but in justice to myself I must observe that the notice for which I am responsible did not consist of mere assertions, but that Dr. Drummond's arguments were directly assailed, and the various points illustrated by such quotations from botanists of eminence as were judged necessary ; and I confidently challenge for myself the credit, small though it be, of having strictly adhered to the question at issue, kept entirely within the fair bounds of literary controversy, carefully avoided personalities, and religiously abstained from the slightest inuendo or insinuation of disingenuous conduct on Dr. Drummond's part. Whilst in the fullest manner disavowing all intention of hurting that gentleman's feelings, I must still maintain that a writer cannot complain of legitimate censure when he lays himself open to the charge of having displayed, in the discussion of a subject chosen by himself, great ignorance, or, at any rate, excessive carelessness ; and I can only state that I am prepared to defend every charge or epithet I may have brought forward or used in the expression of that censure. I cannot suppose that Dr. Drummond can, after this explanation, extend his imputations on the candour, moral courage, and manly spirit of the 'Phytologist' reviewer to,

Sir,

Your obedient Servant,

H. F. HANCE,

The author of the critique in the

'Westminster Review.'

To the Editor of the 'Phytologist.'

London, November 19, 1851.

NOTICES OF BOTANICAL PERIODICALS, &c.

*Hooker's 'Journal of Botany and Kew Garden Miscellany,' No. 36,
December, 1851.*

The papers in this number are intituled :—

'Catalogue of Cryptogamic Plants collected by Professor W. Jamieson in the Vicinity of Quito ; by William Mitten.'

'Sketch of the Vegetation of the Isthmus of Panamá ; by M. Berthold Seemann, Naturalist of H.M.S. Herald.'

‘Second Report on Mr. Spruce’s Collections of Dried Plants from North Brazil; by George Bentham, Esq.’

‘Botanical Information :’—‘Death of Dr. William Arnold Bromfield.’ ‘Mr. Rucker’s Orchideous Plants.’

Mr. Mitten is still persevering in his bryological labours. He describes the following fifteen new species:—*Zygodon fasciculatus*, *Neckera viridula*, *N. debilis*, *Pilotrichum ramosum*, *Hypnum intermedium*, *Barbula limbata*, *Leptotrichum gracile*, *Bartramia aciphylla*, *Hookeria venusta*, *Plagiochila revolvens*, *Jungermannia nigrescens*, *Lejeunea robusta*, *L. rotundifolia*, *L. cyathophora*, and *L. pallescens*. Mr. Mitten also proposes a new genus, which he characterizes under the name of *Leptoscyphus*, the type of which is the *Jungermannia Liebmanniana*, *Ldbg. & Gottsche*.

The following is an extract from M. Seemann’s paper:—

“In a country where Nature has supplied nearly every want of life, and where the consumption of a limited population is little felt, agriculture, deprived of its proper stimulus, cannot make much progress. It is, therefore, in the Isthmus, in the most primitive state: our first parents hardly could have carried it on more rudely. A spade is a curiosity, the plough has never been heard of, and the only implements used for converting forests into fields, are the axe and the machete (or chopping-knife). In 1846, an English gentleman, residing at Panamá, often used to boast jokingly that he was one of the few, if not the only one, in the city, possessing a spade. Since the commencement of the railway, and a more active traffic, both spades and wheelbarrows, the latter formerly an unknown vehicle, have become better known; still they are far from being familiar sights in the country. A piece of ground intended for cultivation is selected in the forests, cleared of the trees by felling and burning them, and surrounded with a fence. In the beginning of the wet season the field is set with plants, by simply making a hole with the machete, and placing the seed or root in it. The extreme heat and moisture soon call them into activity, the fertility of a virgin soil affords them ample nourishment, and without the further aid of man a rich harvest is produced. The same ground is occupied two or three years in succession; after that time the soil is so hard, and the old stumps have thriven with so much energy, that a new spot has to be chosen. In most countries this mode of cultivation it would be impossible to practise; but in New Granada all the unoccupied land is common property, of which anybody may appropriate as much as he pleases, provided he encloses it either artificially or by taking advantage of

rivers, the sea, or high mountains. As long as the land is inclosed it remains in his possession ; whenever the fence is decayed the land again becomes the property of the republic."

"The plantain is most extensively cultivated, and furnishes the inhabitants with the chief portion of their food. The question whether the plantain and its kindred are indigenous to the New World, or whether they have been introduced, has hitherto formed a topic for historians rather than for naturalists, and no satisfactory conclusion has as yet been arrived at. Some incline to the former, others to the latter opinion ; and again a third party thinks that while some species are indigenous, others have been brought from foreign countries. Robertson, following Wafer and Gumilla, classes the plantain among the native productions of America. It was found by the latter two authors far in the interior, and in the hands of Indian tribes who had little or no communication with the Creoles. But as both Wafer and Gumilla travelled a number of years after Columbus's discovery, and as we know that many plants, even some less useful than the different Musas, were disseminated with great rapidity over the territories of the New World, the proofs appear insufficient. Prescott seems to look upon the plantain as introduced, but thinks it is not mentioned in the works of Hernandez. Yet Hernandez does mention the plantain ; he even informs us that it was brought to Mexico from foreign parts, and in his *Hist. Plant. Nov. Hisp. Libr.* vol. iii. p. 172, has the following account :—' *Arbor est mediocris, familiaris calidis regionibus hujus Novæ Hispaniæ, vocatur a quibusdam recentiorum Musa. Folia sunt valde longa et lata, adeo ut hominis superent sæpenumero magnitudinem : fructus racematim dependent incredibili numero et magnitudine, cucumerum crassorum et brevium forma, dulces, molles, atque temperiei proximi, nec ingrati nutrimenti. Eduntur hi crudi, assive ex vino, atque ita sunt gustui jucundigris. Differt fructus magnitudine, et quo minores sunt, eo salubriores et suaviores. Advenam esse aiunt huic Novæ Hispaniæ atque translata ab Æthiopibus aut Orientalibus Indiis, quorum est alumna. Caulis et radix, quæ fibrata est, multis constant membranis, saporis expertibus et odoris, lubricis et frigescentibus, ex quo facile quis conjiciat, quibus morbis possint esse utiles.*' Conclusive as is this statement, both as regards the identity of the plant, and its native country, still some may yet entertain doubts, as Hernandez wrote not at the time of the discovery of America, but towards the end of the sixteenth century. There is, however, another proof that the plantain was introduced. Neither the Quichua nor the Aztec, the two most refined and widely diffused of

all American languages, nor indeed any other indigenous tongue of the New World, possesses a vernacular name for this plant. Even Hernandez, who collected the Aztec names with the utmost care, could find none, and was compelled to place the plantain near the Quauhxilotl (*Parmentiera edulis*, DC.), and call it Quauhxilotl altera; the cucumber-like fruit of the *Parmentiera* appearing to him to form the closest approach to that of the plantain."

Mr. Bentham describes nine new species—*Heisteria ovata*, *H. subsessilis*, *Trichilia excelsa*, *T. macrophylla*, *T. ? microphylla*, *Simaba foetida*, *S. angustifolia*, *Gomphia microdonta*, and *Chailletia vestita*; also a new genus, under the name of *Diplocrater*, which has the small flowers and fasciculate axillary inflorescence of *Heisteria*, but with membranous leaves; the ovary is divided only up to the insertion of the ovules, they, as well as the axile placenta, being entirely free from the summit of the cavity, as in *Olex*, &c., and the stamens equal to and opposite the petals, as in *Schœpffia*. The general habit and foliage remind the author strongly of the figure of *Rhaptostylum*, *α. acuminatum*, in Humboldt & Kunth's 'Nova Genera et Species,' viii. t. 621, but the structure of the flowers is very different.

'*Botanical Gazette*,' Nos. 36 and 37, November and December, 1851.

The November number contains the following papers:—

'On the Name and Origin of the Horse-radish (*Cochlearia rusticana*, Linn.), improperly called *Armoracia* and 'Cran de Bretagne;' by M. Alph. DeCandolle; translated from the *Bibliothèque Universelle de Genève*.'

'On the Duration of certain Plants of the German Flora; by Th. Irmisch; translated from the *Botanische Zeitung*.'

'Proceedings of Societies' [which have appeared in the August, September, and October numbers of the '*Phytologist*']

Contents of '*Annals of Natural History*,' Hooker's '*Journal of Botany*,' the '*Phytologist*,' and '*Botanische Zeitung*.'

'Record of Localities:—*Potamogeton Trichoides* found by Mr. Trimmer, in July, in a pond on Swardeston Common, Norfolk.

Anacharis Alsinastrum in the Trent, found by Mr. Trimmer, at Burton-on-Trent [as recorded in the '*Phytologist*' for 1849.]

'*Molinia cærulea* with variegated leaves at Macclesfield Moss.'

'*Leersia oryzoides* on the banks of the Mole' [see October *Phytol.*], "between East Moulsey Church and Ember Mill, some half mile from the terminus of the Hampton Court Railway;" by Mr. Watson.

The papers in the December number are intituled:—

‘Note on *Athyrium Filix-fœmina*, var. *latifolium*; by F. J. A. Hort.’

‘On the *Sparganium natans*, “L.” Fr.; by John T. Syme.’

‘On the Duration of certain Plants of the German Flora; by Th. Irmisch.’

‘Literature:’—‘The Beauty of Flowers in Field and Wood, containing the Natural Orders or Families of British Wild Plants, &c. By John Theodore Barker. Bath: Binns and Goodwin. London: Whittaker & Co.’

‘Miscellanea:’—‘Record of Localities.’ ‘Sale of Nees von Esenbeck’s Library and Herbarium.’

Mr. Syme, after observing that Fries makes out a good case for separating *Sparganium natans* from a smaller plant, generally passing under that name, but which he (Fries) believes to be *S. minimum*, *Bauh.*, goes on to say that Mr. Babington adopts Fries’s views, and notices the occurrence of both species in this country; and adds:—

“*S. natans*, ‘L.’ Fr., has the sheathing bases of the leaves, and more especially of the bracts, considerably inflated; the fruit oblong, stipitate, and not longer than the subulate beak; the stigma almost linear, and the male heads often numerous.

“*S. minimum*, ‘Bauh.’ Fr.’ has the bases of the leaves and bracts not enlarged; the fruit ovate, sessile, much longer than the conical beak; the stigma very short, ovate, and the male head solitary.

“The following description is from specimens collected this autumn in Aberdeenshire.

“Root fibrous, sending out runners; stem flaccid, round, very faintly striated, from 6 inches to 3 feet 6 inches long; radical and cauline leaves floating, grass-green, very long, linear, from 1 inch to 4 inches broad, flat above, slightly convex on the under surface, with swollen sheathing bases; bracts similar to the leaves, but broader, of a firmer texture and with the sheathing bases more inflated; common flower-stalk sometimes branched but oftener simple; segments of the perianth oblong-ovate, blunt; male heads 1—8 in my specimens, sessile; anthers yellow, six or seven times as long as broad; female heads 1—6, lowest with a long peduncle, uppermost sessile, the peduncles of the intermediate ones getting shorter as they approach the top of the stem; style moderately long; stigma almost linear, long, not much thicker than the style; fruit oblong, with a distinct stalk, which becomes more apparent in drying; beak subulate, as long as the fruit.

“Perennial. Fl. July—Sept. In lakes and still water, more abundant in the North?”

The following is the “Record of Localities:”—

“*Bromus diandrus*, Curt. On the top of the wall by the bridge at Causeway Mill, near Tenby, Pembrokeshire, 1851. C. C. Babington.

“*Triticum laxum*, Fr. Saundersfoot and Penally Sands, also on Gilter Head, all near Tenby, Pembrokeshire, Aug. 1851. I could not find it on any of the similar sandy places to the west of these. C. C. Babington.

“*Potamogeton plantagineus*, Ducr. Castle Martin Corse, Pembrokeshire, Sept. 1851. C. C. Babington.

“*Fumaria micrantha*, Lag. Between Gallows Hill and Burnham, Norfolk, May 30, 1851. Rev. W. W. Newbould.

“*Cicendia filiformis*, Griseb. Penally Warren, Pembrokeshire, 1851. C. C. Babington.”

The following notice appears on the wrapper of this month's number:—

“*Discontinuation of the ‘Botanical Gazette.’*”

“It is with considerable regret that the Editor has to inform the correspondents and subscribers to the ‘Botanical Gazette,’ that his efforts to establish this Journal on a self-supporting basis have been unsuccessful; and since the experiments appear to have been persevered in long enough to place the character of the periodical fully before the botanical public, there seems little to be expected from a further continuation. The present number is therefore the last that will appear; and in relinquishing his post the Editor has simply to offer his warm thanks to those who have co-operated with him in the undertaking, and to add, that in thus breaking the bond that has held them around him during the last three years, he quits a task which has been the cause of much pleasure to him during its progress, and which, notwithstanding the variety of opinions expressed in the pages of the Journal, he can look back upon without having to regret one word calculated to disturb the peaceful progress or lower the dignity of science.”

In the concluding paragraph every reader of the Gazette will sympathize. It is impossible for a journalist to have abstained from giving offence, even to the most sensitive, more rigidly than Mr. Henry has done. No periodical could be conducted in a better spirit, or with more perfect fairness, openness, and impartiality. Although

from the beginning it was my unshaken conviction that the Gazette had no chance of success, and that its amiable and accomplished Editor had estimated at too high a rate the proceeds of botanical journalism, still it was not for me, the proprietor of a similar journal, to discourage or deprecate an undertaking evidently suggested by, and possibly in some slight degree competing with, my own.

'The Gardener's Magazine of Botany,' Nos. 20, 21, and 22, September, October, and December, 1851.

The papers in the September and October numbers are intitled :—

'Cantua Buxifolia,' being the figure, description, history, &c., of a very beautiful shrub, of the order Polemoniaceæ, said to be as easy of cultivation as the Fuchsia. It was collected by Mr. Lobb, in the Peruvian Andes, and introduced into this country by the Messrs. Veitch, of Exeter. The coloured figure is extremely beautiful.

'Theory and Practice of Gardening ; by Mr. H. Bailey.—The Pea, the Apple.'

'On the Management of Strawberries for Forcing ; by Mr. J. L. Middlemiss.'

'The Chemistry of Soils ; by Dr. Voëlcker.—The Classification of Soils.'

'New Fruits :—Gathoye's Peach, Count d'Ansembourg Peach, Leckerbetje Pear, Childeric I. Pear.'

'Pentstemon cyanthus,' being the figure, description, history, &c., of an extremely beautiful, hardy, herbaceous plant, of the order Scrophulariaceæ. It is a native of the upper valleys of the Platte river, in the Rocky Mountains, whence seeds were obtained by Mr. Burke. It was introduced into this country by Messrs. Luccombe, Pince, & Co., of Exeter.

'Vegetable Physiology ; by Arthur Henfrey, Esq., F.L.S., &c.—The Food of Plants.'

'A Plant Morphologically considered ; by the Rev. Dr. M'Cosh, of Brechin.' This has appeared, *in extenso*, in the pages of the *'Phytologist.'*

'Notes, cultural, critical, and suggestive :—Nocera Onion, Climate of Natal, Culture of the Vine, Grouping of Trees in Parks.'

'Grevillea lavandulacea,' being the figure, description, and history of a pretty, erect, greenhouse shrub, of the order Proteaceæ. It was

raised by Messrs. Henderson, of the Pineapple Nursery, Edgeware Road, from seed sent by Dr. Drummond from the Swan-River settlement.

‘The Genera and Species of Cultivated Ferns;’ by Messrs. Houlston and Moore. The species described in these numbers are:—*Asplenium serratum* of Linnæus, from Brasil; *Brasiliense* of Swartz, from various parts of South America; *palmatum* of Lamarck, from the South of Europe, Madeira, Canary, the Azores, &c.; *oligophyllum* of Kaulfuss, from Brasil; *elongatum* of Swartz, from Java and the Philippine Islands; *lucidum* of Forster, from New Zealand; *heterodon* of Blume; *compressum* of Swartz, from St. Helena; *obtusatum* of Forster, from New Zealand, New Holland, and Van Diemen’s Land; *lætum* of Swartz, from the West Indies; *marinum* of Linnæus, from the South of Europe, the Channel Islands, Madeira, Teneriffe, and Northern Africa (this species also inhabits Britain); *Hendersoni* of J. Houlston, a new species, raised from seed by Mr. Henderson, gardener at Wentworth House, Yorkshire, but its country, and the source whence the seed was received, are entirely unknown; *angustifolium* of Michaux, from North America; *comptum* of Swartz, from Jamaica; *salicifolium* of Linnæus, from Jamaica; *pulchellum* of Raddi, from Brasil and the West Indies; *dentatum* of Linnæus, from the West Indies; *flabellifolium* of Cavanilles, from New Holland and Van Diemen’s Land; *radicans* of Swartz, from Jamaica and Cuba; *pumilum* of Swartz, from the West Indies and the Philippine Islands; *Trichomanes* of Linnæus, found throughout Britain, Europe, Asia, and North America; *monanthemum* of Smith, from the West Indies, Peru, and Cape of Good Hope; *dimidiatum* of Swartz, from the West Indies; *ebeneum* of Aiton, from the Cape of Good Hope, Mexico, and North America; *mutilatum* of Kaulfuss, from the Cape of Good Hope; *viride* of Hudson, Britain and Europe generally; *Petrarchæ* of DeCandolle, from the South of France; *reclinatum* of J. Houlston, a beautiful, evergreen, pendulous fern, from St. Helena, now described for the first time; *brachyopterum* of Kunze, from Sierra Leone; *flacidum* of Forster, from New Zealand; *rachiron* of Raddi, from Brazil and the West Indies; *scandens* of J. Smith, from Java and the Philippine Islands; *bulbiferum* of Forster, from Zealand; *appendiculatum* of Presl, from the Mauritius; *diversifolium* of Allan Cunningham, from New Holland; *septentrionale* of Linnæus, Britain and Europe; *germanicum* of Weiss, Britain and Europe; *Ruta-muraria* of Linnæus, Britain, Europe, and North America; *Zamiæfolium* of Willdenow, from Mexico, Hispaniola, and New Holland; *furcatum* of

Thunberg, from the Cape of Good Hope; præmorsum of Swartz, from the West Indies, Teneriffe, Canary Islands, and New Holland; falcatum of Lamarck, from the East and West Indies, St. Helena, and New Holland; polyodon of Forster, from New Zealand; serra of Langsdorff and Fischer, from Brasil; fontanum of Robert Brown, Europe, and the authors also add Britain, which, I think, has been shown to be an error; lanceolatum of Hudson, from Britain, Madeira, Channel Islands, Hungary, Bohemia, and South America (the authors might have added France, Spain, Portugal, and Algeria); Adiantum-nigrum of Linnæus, from Britain, Europe, Madeira, and Carolina; acutum of Bory, from Teneriffe; auritum of Swartz, from the West Indies; planicaule of Wallich, from the East Indies; pubescens of J. Houlston, a new species, supposed to be North-American;* Filix-femina of Linnæus, from Britain, Europe, Asia, and North America; Michauxii of Sprengel, from North America; Brownii of J. Smith, from New Holland and Van Diemen's Land;† axillare of Kaulfuss, from Madeira; and umbrosum of R. Brown, also from Madeira. Thus we have no less than fifty-eight species described, and their native countries specified.

There was no number published in November, but one has appeared on the 1st of December, and this will be the last. Its contents are intituled:—

‘Crocus vernus,’ var. *Leedsii*, a beautiful garden crocus.

‘Vegetable Physiology; by Arthur Henfrey, Esq., F.L.S., Lecturer on Botany at St. George’s Hospital.’

‘Theory and Practice of Pruning; by Mr. H. Bailey, gardener to G. V. Harcourt, Esq., M.P., Muncham Park.—Plum, Gooseberry, Red, White, and Black Currant, Raspberry, Filbert.’

‘The Palmyra Palm.’

‘*Æschynanthus splendidus*,’ being the description, figure, and history of a very beautiful hybrid *Æschynanthus*, raised by Messrs. Lucombe, Pince, & Co., of Exeter, from seed of *Æ. speciosus*, impregnated by *Æ. grandiflorus*.

‘The Genera and Species of Cultivated Ferns; by Mr. J. Houlston, Royal Botanic Garden, Kew, and Mr. T. Moore, F.L.S., &c.’ The species described are:—*Woodsia hyperborea*, *W. ilvensis*, *W. mollis* (the *Physematum molle* of Kaulfuss), and *W. obtusa*, giving the

* This and the two following are *Athyria* of Roth, Presl, Newman, Babington, &c.

† This and the two following are *Allantodieæ* of Robert Brown.

synonym of *W. alpina*, *Newm.*, to the first of these (the authors have fallen into an error; their figure represents *W. Ilvensis*, *Newm.*), *Cystopteris fragilis*, *C. dentata*, *C. Dickieana*, *C. alpina*, *C. tenuis*, *C. montana*, 31 species of *Lastrea*, 15 of *Polystichum*, 1 of *Cyclopteris*, 1 of *Didymochlæna*, 7 of *Nephrolepis*, 2 of *Oleandra*, 1 of *Dictyoxiphium*, 2 of *Lindsæa*, 1 of *Leucostegia*, 1 of *Microlepia*, 11 of *Davallia*, 1 of *Balantium*, 3 of *Dicksonia*, 2 of *Cibotium*, 4 of *Cyathea*, 4 of *Hemitelia*, and 6 of *Alsophila*.

‘Garden Hints for Amateurs.’

‘On the Barometer; by E. J. Lowe, Esq., F.R.A.S., M.B.M.S., &c.’

Discontinuation of the ‘Gardener’s Magazine of Botany.’

It is with much regret I have to announce that this useful work is discontinued. “Experience,” say the Editors, “has shown them that among gardeners, the numbers who seek for scientific information and technical botany are a limited class; and although they [*i. e.*, the proprietors] have been honoured by support which has secured the highest circulation attained by any high-priced botanical publication, still that sale has fallen short of a remunerative point.”

The ‘Gardener’s Magazine of Botany’ is to be succeeded by the ‘Companion to the Flower Garden,’ the very name of which implies that it is to take its station on ground not only occupied, but crowded. If it maintain a footing it will be highly creditable to the taste and energy of its conductors. I can only say, may its bloom be perpetual!

‘*The Annals and Magazine of Natural History*,’ Nos. 47 and 48, November and December, 1851.

The only botanical paper in the November number is intituled ‘A List of all the Mosses and Hepaticæ hitherto observed in Sussex; by William Mitten, A.L.S.,’ and contains a *first* description of *Bartramia pumila*, found in a wet place near Tilgate Pond, Tilgate Forest, Sussex.

The only botanical information I find in the December number is a note by Mr. C. C. Babington, on the occurrence of *Acanthus mollis* in the Scilly Islands.

“In answer to questions addressed to the Rev. J. P. Mayne, that gentleman has informed me that it grows in a spot separated from some houses by a narrow field, on the south side of a hedge, upon some heaps of stones collected there on the destruction of an old lane that formerly passed the spot. An old man who rents the field tells

him that he remembers having taken notice of the plant fifty years since; another man vouches for forty years. The plant occupies a space of about 20 feet by 5 or 6, and is not found in any other part of St. Agnes, nor, as far as Mr. Mayne knows, in any of the other islands. Twenty years since St. Agnes, as he has ascertained, could not boast of even one garden, and therefore floral culture could hardly have caused its introduction more than fifty years since, when potatoes and rye and an occasional cabbage were the *only things* grown in the island by people who live wholly by the sea. Strange birds often visit the Isles during the south-easterly winds, and may, as Mr. Mayne justly suspects, have brought seeds from the continent. He adds, that ‘a brother clergyman, living at Marazion, near Penzance, has some plants of it growing in his garden. He has never seen the plant elsewhere, and is quite at a loss to account for their presence.’ I have no authority for supposing that it is found upon the Atlantic coasts of France, but it inhabits damp and stony or rocky places in the south of that country. The peculiarly mild winter climate of Scilly is not unfavourable to it, and it may therefore be an old if not the oldest inhabitant.”

Acrostic written at the Grave of the late Thomas Edmonston, Naturalist to H.M.S. ‘Herald,’ by one of his Fellow-voyagers.

'T was from this beautiful and rock-bound bay
 H eaven deemed it right to call his soul away.
 O ne moment's warning was to him denied :
 'M idst life, and youth, and health, and hope he died.
 A las ! that boastful Science could not save
 S o apt a scholar from this early grave.

 E ven those who knew not of his private worth
 D eplore his talents buried in the earth.
 'M ong flowers that gem the softly verdant ground,
 O 'erspread with trees, his grave is to be found.
 N o crowd his resting-place shall ever view ;
 S till sad affliction will induce a few
 T o gaze where plants o'er which he lavished years, }
 O 'er him now silent, shed their dewy tears, }
 N or seek to hide a grief denied to nobler biers. }

P. A. W.

Sua Bay, Ecuador, Oct. 18, 1847.

[Mr. Edmonston will be well remembered by many readers of the 'Phytologist' as one of its earliest and most interesting contributors. —*Ed.*]

PROCEEDINGS OF SOCIETIES.

Linnean Society of London.

December 2, 1851.—W. Yarrell, Esq., in the chair.

Mr. Moore, of the Botanic Garden, Chelsea, presented specimens of the staminiferous cones of *Zamia furfuracea* to the museum.

Mr. Adam White exhibited two boxes of insects, containing chiefly new or rare species from South America, collected by Messrs. F. Smith and H. W. Bates. In the collection made by the latter gentleman were many species of butterfly, one of the most beautiful of which had been named, after him, *Galathea Batesii*. In speaking of Mr. Bates, Mr. White said that he had left England in May, 1848, and had collected plants and insects in the neighbourhood of Parà, and afterwards proceeded up the Amazons, as far as Ega, and had sent home many very valuable collections. He returned to Parà in May last, and was now anxious to proceed to investigate the natural history of the branch of the Amazons known as the Rio Tapajos. He had been much hampered for want of means, but, provided he could obtain resources, he hoped to remain in this district for two or three years. The mouth of the Tapajos, where the town of Santarem is situated, is about 500 miles from Parà; the river extends 1000 or 1200 miles into the interior of Brazil, to the province of Matto Grapo.

A continuation of Mr. Miers's paper 'On two New Genera of South-American Plants' was read. The second genus belonged to the order Bignoniaceæ. It was a leafless, shrubby, spinous plant, eight feet high. Hence the name proposed for it by the author was that of *Oxycladus aphyllus*. It differs in some material points from the order to which it belongs, and constitutes a sub-order, *Oxycladeæ*.

Botanical Society of Edinburgh.

Thursday, November 13, 1851 (being the sixteenth session).—Professor Balfour, President, in the chair.

There was a large attendance of members and visitors, and among others Mr. Fortune, who has just returned from India, after the successful introduction to the Himalaya district of tea plants and tea manufacturers from China.

The President in taking the chair alluded to the success which had attended the meetings of the Society during the bygone session, the increased zeal for botany among the members, and the numerous donations made to the herbarium and botanical museum in Edinburgh. He urged on the members the desirableness of renewing their exertions this season; and he particularly invited the young members to record the observations which they made, and thus render them available for the purposes of science. He concluded his address by alluding to the deaths which had taken place among the members of the Society since the last meeting, and in an especial manner referred to the labours of the late Dr. Neill, Mr. David Steuart, Dr. Bromfield, Mr. James Nicol, and Mr. James Cunningham. All of these gentlemen, in their different departments, had done much to forward the science of botany.

The following donations were announced to the Society's library and herbarium:—‘The British Species of Angiocarpous Lichens, elucidated by their Sporidia,’ by the Rev. W. A. Leighton, from the Author; several pamphlets on Indian botany, by Dr. Hugh Cleghorn, H.E.I.C.S., from the Author; ‘Botanical Gazette,’ from the Editor; a large collection of Canadian plants from Dr. Philip MacLagan; Iceland plants from Mr. Paul; British plants from Mr. T. Anderson and Mr. Parker, Torquay; also Continental and British plants from Mr. Blackie, the former including *Epipogon Gmelini* and others of interest, and amongst the latter was a specimen of *Linnæa borealis* from near Aberdeen, bearing four flowers, arranged in an umbellate form, on one peduncle. Thanks were voted to the donors.

Mr. M’Nab announced the following donations to the museum at the Botanic Garden since the last meeting of the Society:—1. From Mrs. Sawers, Kingston, Jamaica:—Specimens of Cassava cake, lacebark, soap-berries, fibres of banana, specimens of cotton, and of paper made from the epidermis of a plant. 2. From Dr. Hugh Cleghorn, H.E.I.C.S.:—Specimens of Malacca cane (*Calamus Scipionum*), fossil wood from Godavery (Madras), and seed-vessel of *Sterculia foetida*.

3. From Captain Grange, Newton Green, Ayr:—Specimens of cloth made from pine-apple fibre, &c., paper made from bamboo, New-Zealand woods in the form of paddles, &c. 4. From Captain Gillespie, Leith, through Mr. Bryson:—Large section of a palm stem. 5. From Sir William Keith Murray, Bart., Ochtertyre:—Large section of a knot of elm and section of ash grown at Ochtertyre. In transmitting the specimens Sir William Murray remarks:—"I beg to send herewith sections of elm and a plank of ash grown at Ochtertyre, within a hundred yards of each other, on a light soil on trap rock. The largest diameter of the section is five feet two inches." There was also sent a drawing of the elm from which the section was taken. 6. From Mr. Henderson, Wentworth House, Yorkshire:—Sections of *Gleditschia triacanthos*, *Salisburia adiantifolia*, *Quercus Ilex*, and of a species of *Eucalyptus*. 7. From W. O. Priestley, Esq.:—Twelve sheets of dissections illustrating some of the British species of the genus *Carex*. These dissections were rewarded with a prize at the botanical class in the University, in July last. 8. From Professor Fleming:—Specimens of the resin of the grass-tree (*Xanthorrhœa arborea*?) of New Zealand. 9. From Miss Neill, Cannonmills Cottage:—Collection of woods from Van Dieman's Land, fruit of the double cocoa-nut, cone of *Pinus Lambertiana*, and various sections of woods. 10. From Mr. Thomas Waddel, Cumbernauld:—Fossil plants from the coal measures, including species of *Stigmaria*, *Sigillaria*, *Lepidodendron*, and *Calamites*. 11. From Captain Boyle, Seaside Cottage, Aberdour, Fife, per Mr. Lawson, jun.:—Fruit of *Passiflora cærulea*. Captain Boyle writes thus:—"I send specimens of the fruit of the passion-flower, grown in the open air, on the wall of my house, Seaside Cottage, Aberdour, Fife. The plant is four years old, and the situation within twenty yards of high-water mark. Many of the less hardy plants, such as myrtles, grow well in the open air in the same locality." A branch of myrtle which had blossomed in the open air accompanied the fruit of *Passiflora*.

Dr. Balfour exhibited a specimen of the fruit of Tomato in which five separate succulent carpels were included within a single fruit, an appearance similar to what is frequently exhibited in the orange.

Dr. Balfour also exhibited specimens of *Zostera nana* from the shore of the river Blyth, in Northumberland, which had been sent by Mr. Storey, of Newcastle, for the Society's herbarium.

Mr. G. Lawson exhibited a fresh specimen of the immature fruit of *Victoria Regia*, grown in the stove aquarium at the garden of the Royal Botanic Society of London, Regent's Park, where the plant

had been cultivated with great success. Mr. Lawson presented the specimen to the museum at the Botanic Garden.

The following papers were read :—

1. ‘On the Gulf-weed (*Sargassum bacciferum*);’ by Samuel Mossman, Esq. The Sea of Sargasso may be considered as an eddy, situate in point of latitude between the regular equinoctial current on the south, setting to the westward, the south-easterly current from the northern sea on the east, and as the recipient of the gulf stream from the north and north-west. The tract which is occupied is more than 1200 miles in length from north to south, and within these limits the weed appears in greater quantities than elsewhere; and it does not appear to have varied its position in any degree during the last fifty years. Hence it appears to have been stationary for ages; perhaps from the time of Columbus, by whom it was first noticed. Major Rennell observes that the breadth of this mass of weed is small in proportion to its length, being drawn out into a kind of stream, and bending a little to the east of south. Dr. Franklin crossed it in lat. 36 deg. 1 min., and found it less than fifty miles in breadth; but it spreads to the southward, and in lat. 20 deg. appears to have been, at times, 150 miles wide, although, perhaps, consisting only of various parallel streams of weed. It has been observed that the waters of the Atlantic have a greater tendency towards the middle of the ocean than otherwise; and this seems to indicate a reduced level, forming a kind of hollow space or depressed surface. It is certain that the setting of the currents is such as might be expected to take place if such a hollow existed; for the currents do really set into the Sargasso Sea from the north and the south, whilst in the middle part, although within the region of the trade-wind, the currents are not regular, but indicate a kind of vortex. From the great central mass portions of the weed appear to be carried by the drift to the south-west, towards the Virgin Isles, Porto Rico, &c., until they fall into the great equatorial current. Mr. Mossman entered at considerable length upon the much-disputed question of the origin and mode of growth of *Sargassum*, and detailed the opinions of the various botanists and travellers who had written on the subject. He remarked that there was a great want of observations on this subject by really scientific botanists, as many facts bearing on the question rest solely on the authority of travellers unacquainted with botany, and therefore not commanding implicit reliance. He concluded by reading a letter addressed by Dr. Robert Brown, President of the Linnean Society, to Admiral Sir

Francis Beaufort, for communication to Baron Alexander von Humboldt, which has been laid before the Linnean Society [see Phytol. iv. 28]. In illustration of his paper Mr. Mossman exhibited a fine specimen of *Sargassum bacciferum*, and presented the same to the Society's herbarium.

Dr. Greville remarked that Mr. Mossman had given a very full and complete account of all that was known relative to this sea-weed. Dr. G. believed that the gulf-weed was, no doubt, at some period of its existence attached to rocks, as indicated by its disk-like root. These so-called roots of sea-weeds, however, he thought, only acted as hold-fasts (*crampons*), and were not the organs of absorption as in ordinary plants. Sea-weeds absorbed throughout their whole substance, and the use of their roots was to allow them to grow in favourable circumstances for taking up nourishment. He considered that it was highly probable that the gulf-weed increased by lateral shoots when floating in the sea. This he was the more disposed to believe, from what he had seen in the case of *Fucus Mackaii*. He had observed this sea-weed on the coast of Skye, and on various parts of the west coast of Scotland, northwards as far as Cape Wrath, filling up bays at certain seasons, and growing with its branches upright, in loose mud, without any attachment. Among thousands of such plants, forming a close meadow of sea-weeds, he was not able to find a trace of roots. The plants seemed to thrive and vegetate luxuriantly.

2. 'On the Correspondence between the Angles formed by the Veins of the Leaves, and those formed by the Branches of the Stem; by Mr. William Mitchell, Edzell (communicated by the Rev. Dr. M'Cosh). Having been informed that the Rev. Dr. M'Cosh had thrown out the idea that a plant, considered morphologically, may be regarded as a unity; and, in proof of this view, had produced many examples among forest trees, pointing to the similarity of the ramification of the branches and the venation of the leaves, the general correspondence of the angles in both, and the agreement of the form of the leaf, or leafage from one point, with that of the whole tree; I felt inclined to test the truth of the theory, so far as I was able, by its application to herbaceous plants. For this purpose I examined a great number of these plants, and found the results, generally, the same as those given in the following list, which contains a few of the most carefully-measured of our common wild flowers:—

Tansy (*Tanacetum vulgare*). The angle which the branches of this plant makes with the stem is 45 deg., and it is equal to that which the side veins of the leaf make with the central vein. In the other

examples we shall express the two equal angles by the term "normal angle."

Eyebright (*Euphrasia officinalis*). Normal angle 45 deg., average.

Scabious (*Scabiosa succisa*). N. a. 40 deg. upper branches and veins; 35 deg. lower veins and root-leaves.

Knapweed (*Centaurea nigra*). N. a. 55 deg., average. The veins at the base of the leaf run alongside the middle vein; and, in keeping with this, the plant has a tendency to send off several branches from the root, with tufts of root-leaves. This arrangement seems to be carried out in the ribbed leaves, and whorls of root-leaves and flower-stalks, of the plantains, such as our well-known ribwort.

Fumitory (*Fumaria officinalis*). N. a. 60 deg.

Meadow-sweet (*Spiræa Ulmaria*). N. a. 35 deg.; terminal branches and veins somewhat less.

Groundsel (*Senecio vulgaris*). N. a. 30 deg.

Gentian (*Gentiana campestris*). N. a. about 20 deg.

Corn Marigold (*Chrysanthemum segetum*). N. a. 35 deg.

Speedwell (*Veronica Beccabunga*). N. a. 45 deg.

Buckwheat (*Polygonum Persicaria* [? *Fagopyrum*.—Ed.]). N. a. 40 deg.

Hawkbit (*Apargia autumnalis*). N. a. about 50 deg.

Thistle (*Carduus arvensis*). N. a. 35 deg.

Nipplewort (*Lapsana communis*). N. a. about 40 deg.

Dead-nettle (*Lamium album* and *purpureum*). N. a. 45 deg., average.

Avens (*Geum urbanum*). N. a. 35 deg., average.

Vetch (*Vicia lutea*). N. a. for branches and leaflets about 45 deg.

Millfoil (*Achillea Millefolium*). N. a. for branches and divisions of leaflets 35 deg.

Speedwell (*Veronica Chamædrys*). N. a. varies from 35 deg. to 45 deg.

Wood Sage (*Teucrium Scorodonia*). N. a. 35 deg.

Chervil (*Anthriscus sylvestris*). N. a. about 45 deg.

Mint (*Mentha arvensis*). N. a. 40 deg., average.

Nettle (*Urtica urens*). N. a. 49 deg. The leaf, besides, has several principal veins springing from the base, which are represented by a bushy stemage at the root.

Atriplex (*Atriplex patula*). N. a. 45 deg., average.

The angles, as given above, have been deduced from measurement of numerous specimens, in different localities; and where the word "average" is added, it is to be understood that the angles of branches

and veins of leaves vary equally, and the one stated is taken about the middle of the plant and the middle of the leaf. There are many plants, the leaves and branches, or leaf-stalks, of which are triplicates, such as trefoil, wood-sorrel, wild strawberry, wood anemone, *Tussilago*, &c. Others, having whorled leaves, or the leaf rounded, present a similar arrangement in the stemage, or an approach to it. Bed-straw, field madder, corn spurry, &c., are examples of the first, and geraniums, ranunculuses, the marsh-penny, the marsh-marigold, and tormentil of the second. Stemless plants seem to be most difficult to bring within the scope of the analogy in question; and this, I think, might easily be accounted for; but in the mean time I shall not enlarge.

Assuming the foregoing observations to have been accurately made, it would appear that Dr. M'Cosh's views are borne out by Nature in a very remarkable manner, and demand still further investigation. Much, no doubt, remains to be done in the study of vegetable morphology; and it strikes me that this is an advance in the proper direction. We find in plants divisions and subdivisions carried out with surprising regularity, so as often to give the leaf, or leafage, a form resembling that of the whole plant; and we find, on measuring these successive divisions, that equal angles have generally been maintained throughout. Hence we can scarcely resist the conclusion that a plant is a unity, all its parts being formed after the same model. It is in strict uniformity with that beautiful connexion which subsists between unity and diversity in the works of Nature, that there should be fundamental forms in the vegetable as well as in the mineral kingdom. In crystals we see variety produced by combinations of forms which may all be referred to one in each crystal, as a base, or type; and still further, that the edges and faces of consecutive forms in these combinations have equal angles; and in vegetables, I conceive, we may see the same, by modifications, in each of one fundamental form, and that the leaf. May we not also see that the alternate process, by which the face of one simple form of crystallization assumes the position of the edge of another to which it is immediately related, is represented in the ramification of a plant, and some of its peculiarities marked by the measurement of the spiral thread? Be this as it may, an equality of angles does certainly predominate in the vegetable kingdom; and it may not be too fanciful to suppose that we shall yet have a classification of vegetable forms similar to that of our systems of crystallization, in which the normal angle will form a leading characteristic in the determination of species.

In sending the paper Dr. M'Cosh writes as follows:—

“For the last six weeks or two months I have been prosecuting my inquiries; and the result is a firm conviction that there is a truth discovered by me, though I am not sure that I have arrived at the correct expression of it. In July I talked with considerable hesitation of the angular measurements submitted by me. Some of them were not made upon a sufficiently large induction. I can now state, with great confidence, that there is a most wonderful correspondence of the angle of the venation of the leaf with the angle of ramification of the stems. I can now measure the angle of the tree with great ease. In my first attempts I tried fully-grown trees; but the result was far from being satisfactory, as the angle is modified by the weight of the branches. Then I tried the young tree,—the tree pretty fully grown, but whose branches had not been bent. This was my method in July. My common plan now is to *take a freely-growing branch from a healthy tree, and measure the angle of the branchlets*. The careful measurement of a few such branches will give the normal angle of ramification; and it will be found to be much the same as the angle of venation. I have now a large body of facts on that subject in my note-book, but I am not to trouble you with them at present. I have occasionally met with difficulties, but no contradictions. As an illustration of my difficulties, I may mention that in old, decaying trees the angle even of the lateral branches is wider than the normal angles. I have also an idea that all spines are at a wide angle, and that branches tending to become spines are at a wider angle than the normal one. But instead of forwarding my own observations, I enclose a set of observations, made with instruments, by Mr. Mitchell, upon herbaceous plants. Mr. Mitchell is a schoolmaster at Edzell, about six miles from this. He is possessed of extensive scientific knowledge, and is a respectable botanist. His own researches in crystallography led him to set high value on angles; and he took up my theory heartily, and has been pursuing the investigation in his own way. He has handed me the results. I take the liberty of forwarding them to you. I confess I am anxious to keep the matter before the public; and I should like Mr. Mitchell's researches to be made known. He is quite willing that they should be so, and gives his name openly, and with great confidence that his statements will bear investigation.”

3. Tables illustrative of the Morphology of Plants; by the Rev. Dr. M'Cosh, Brechin.

I. Woody plants whose leaves have little or no petiole, and which have branches along the axis from near the root.

Boxwood	Holly	Beech†
Privet	Philadelphus	Oak
Bay laurel	Laurustinus	Elm
Portugal laurel*	Arbutus	Alder (very small)

II. Woody plants whose leaves have a pretty long petiole, and which have a pretty considerable extent of unbranched axis from the root upwards.

Cherry	Sycamore	Laburnum
Apple	Maple	Birch
Pear	Horse chestnut	Lilac
Lime	Service-tree	

I cannot say how this law applies to plants which have not a woody structure.

III. Plants whose leaves have several ribs, or main veins, proceeding from the base of the leaf, and whose branches tend to whorl round the axis.

Sycamore	Ivy	Nettle
Maple	Ground ivy	Alchemilla
Currant	Pelargonium	Mallow
Gooseberry	Geranium	Potentilla
Guelder rose	Hollyhock	Tussilago
Philadelphus	Rhubarb	Cineraria
Vine	Indian cress	Violet

IV. Plants with separate leaves, or leaflets, coming off from nearly one point, and with branches of a similar kind.

Laburnum (leaflets in threes)	Common barberry	Ranunculus
Broom (leaflets in threes)	Alchemilla alpina	Fuchsia
Rhododendron ponticum	Lupin	Columbine
Azalea (tendency to verticillation in the leaves)	Wood Anemone	

In speaking of whorled branches I mean that either the leaf-stalk or the branches, properly so called, *one or both*, tend to whorl round the axis.

V. Plants of which the branches and the veins of the leaves go off at the same angle.

* The Portugal laurel has a short petiole, and also a short, unbranched axis.

† The beech and oak are acknowledged by all woodmen to be branched from the root, or near the root, when growing freely.

Trees.

	<i>Deg.</i>		<i>Deg.</i>		<i>Deg.</i>
Horse chestnut . . .	50.55	Privet	50	Rose	50
Service-tree	48	Bird cherry . . .	60.64	Sycamore	45
Siberian lilac	40	Lime	40	Cherry	50
White lilac (at widest) .	58	Hazel	42.43	Ash	60
Broad-leaved spindle-tree	40	Jessamine	40.45	Elm	50
Raspberry	42	Mountain ash . . .	45	Alder	50
Portugal laurel . . .	50.60	Rhododendron . . .	70	Box	60
Bay laurel	50.60	Holly	55	Oak	50
Laburnum (sml. branches)	60	Red dog-wood . . .	45	Beech	45
Gray willow	60.64	Osier willow . . .	45.50	Orange	? 55
Pyrus domestica	35	Guelder rose	45	Birch	48.35

Herbaceous Plants.

	<i>Deg.</i>		<i>Deg.</i>		<i>Deg.</i>
China Aster	28.30	Marigold	38.48	Lupin	40.44
Antirrhinum	28.30	Rose willow	30.35	Phlox	40.48
Ten-week stock	35.38	Zinnia	23.25	Poppy	20.25
Xeranthemum lucidum	18.20	Fuchsia	60	Verbena	35.38
Solidago Virgaurea . . .	30	Valerian	25	Columbine	25.28
Clarkia elegans	36.40	Salvia (red)	35	Mallow	36.38
Queen of the meadow	30.35	Pentstemon	38	Alonsoa	38.40
Wild geranium	50.64				

In the leaves of many trees the small veins come off at a wider angle than the large veins. But it may be observed, too, that in many trees the small branches come off at a wider angle than the large branches, as in the oak, for instance. What woodmen in this part of the country call *spray* seems in the tree to correspond to the small veins in the leaf.

Dr. M'Cosh likewise added the following notes on the measurement of angles, &c. :—

1. The instrument employed is the old goniometer, being a semi-circle graduated with a movable index.

2. The angle of the leaf can easily be measured. The angles of the branches of herbaceous plants can easily be taken in autumn. It is more difficult to determine the normal angles of trees. It can be done either by taking a young tree not bent with the wind, or twisted by the weight of its own branches; or, *better still, by taking the freely-growing branch of a healthy tree, and measuring the angle of its branchlets*, the most of which will be found within a few degrees above or below the normal angle.

3. In measuring the angle of ramification, take the axis below the

branch exclusively, and not the axis above the place at which the branch goes off.

4. It is to be observed that on most plants the angle widens as we ascend from the base to the middle, and then narrows rapidly as we ascend from the middle to the apex. This is the case both with the branches of the plant and the veins of the leaves; but in some cases the angle is widest at the foot and narrows as we ascend. Thus the birch begins at nearly 50 deg., and speedily comes down to 35 and even 30 deg. The *Salvia* (red) begins at 45 deg., and speedily reaches its average of 35 deg. The white lilac begins at 58 deg., and comes down to 50 and 45 deg. The same holds of some, but not all, kinds of poplar. In the above table the angle taken is supposed to be the average of those fully developed, being commonly the third or fourth from the base of the leaf.

5. In plants with spines. All spines and branches tending to become spines have an angle wider than the normal one. Have not old, decaying trees the same?

6. *Exceptions*.—While I am convinced of the general tendency of the stemage and leafage to take the same form, I am prepared to believe that there may be exceptions. I am inclined to think that the exceptions will fall under the following rule:—The genus, as a whole, will have a correspondence between leaf and branch; and most of the species under the genus will vary in leaf when they depart in branch from the normal form; but there will be found varieties of a singular description (I suspect some kinds of poplar), especially monsters, which will differ from the genus in the stem, while they retain the generic leaf, or *vice versa*.

4. 'On Fossil Woods from Antigua and Australia;' by R. Bryson, Esq. Mr. Bryson exhibited specimens of silicified woods from Antigua and Australia, the former being both exogenous and endogenous, while the latter were coniferous. Some of the specimens were about a foot in diameter, and were beautifully polished by Mr. Young. Mr. Bryson made some remarks on the process of silicification, and pointed out the difference of appearance presented by the woods. Some were completely opalized and hard throughout; others had portions, either external or internal, which were less completely silicified, and in a friable state. In this latter state the Australian woods showed the coniferous structure, while the opalized forms did not show disks under the microscope.

Mr. Thomas Anderson exhibited several fossil leaves from the tertiary formation, belonging to dicotyledonous plants.

Mr. James B. Davies exhibited the following specimens from Mr. Lawson, jun., who remarked, in a letter accompanying them, "I send a few specimens of novelties which may perhaps be interesting to some of the members:—Some new varieties of curiously-marked kidney beans from Portugal; new turnips and radish from France (the white variety is the earliest I have ever heard of, being ready in three weeks, I understand); specimens of the *Bromus Schraderi* and *Canadensis*, showing very abundant foliage at this season (this grass has been long known to botanists, but there seems great difficulty in making our agricultural friends believe in its value); *Isatis Indigotica*, as employed in China for dyeing tea."

Mr. Fortune remarked that the early turnip was common in China, and had probably been imported into France, whence Mr. Lawson had obtained it.

Mr. Davies also exhibited specimens of *Elymus hordeiformis* affected with ergot, and a variety of *Elymus Canadensis* with a branching spike of several heads.

Mr. Stark exhibited growing specimens of Portugese plants, amongst which was a beautiful species of *Linaria*, apparently allied to *L. supina* or *L. alpina*, but with large flowers, of a rich purple.

At the request of the President, Mr. Fortune gave some interesting information relative to the manufacture of tea in China, and also in regard to the tea plantations belonging to the Hon. East India Company in the Himalaya.

Daniel Oliver, jun., of Newcastle-upon-Tyne, was elected an Ordinary Fellow. Six candidates were proposed for election at the next meeting, which will take place on the second Thursday of December.

Thursday, December 11, 1851.—Professor Balfour, President, in the chair.

The following donations were announced:—A very large and valuable collection of Fungi from Dr. Greville; British plants from Mr. Thomas Moore, Botanic Garden, Chelsea, and Mr. Withers, Bath; 'Botanical Gazette,' from the Editor.

Dr. Balfour exhibited the following donations, presented to the museum at the Botanic Garden by Dr. Alexander Hunter, Madras:—1. Fibres of the *Musa paradisaica*, or plantain; 2. Cord made from the fibres of that plant; 3. Paper made from the fibres of the same plant; 4. Various kinds of caoutchouc, procured from *Ficus indica*,

F. religiosa, *F. racemosa*, and milk-hedge (perhaps *Euphorbia* sp.). From Lady Harvey, Carlton Terrace :—Miscellaneous capsules, and sections of woods. From Dr. Scott, Dean Terrace :—Two legumes from Madeira. From Mr. M'Nab, Botanic Garden :—A large collection of seeds, cones, and sections of woods, being the nucleus of a private collection, and now given over to the museum, in all 180 specimens. From Mr. James Laing :—Two legumes from Calcutta. From Mr. William Baxter, Riccarton :—A monstrous branch of *Pinus Pinaster*, blown down at Riccarton, by the late gale.

Mr. George R. Tate exhibited an interesting series of plants from Northumberland, which he presented to the Society, including *Cypripedium Calceolus* and other rare species.

Mr. G. Lawson exhibited growing plants of the recently-discovered *Potamogeton Trichoides*, which he had some time ago received through the kindness of the Rev. Kirby Trimmer, from the station at Swardston, Norfolk. He likewise exhibited fresh specimens of the fruit of this species, and pointed out the specific character afforded by the prominent tubercle on the "inner" edge of the fruit. "Fr. often verrucose on the back and with a tubercle on each side at its base" (Bab. Man. 3rd ed.). In a letter accompanying the plant Mr. Trimmer remarked :—"There is every reason, I think, to consider *Potamogeton Trichoides* not introduced, but native, at the Framlingham, Earl, and Swardston stations. I have known for the last three years of the plant existing in the latter station, but could never till July in the present year meet with fruit on it, and even then only a very few specimens, under a dozen."

Dr. Balfour read a letter from Dr. Dickie, mentioning the occurrence of *Carex-rigida* close by the sea, within reach of the spray, on Downpatrick Head ; also the occurrence of *Hieracium nigrescens* ? and *Hypnum rufescens* on Ben Bulbin.

Dr. Balfour also read a letter from Mr. James Backhouse, jun., York, in which he states that he has fairly proved the *Hieracium plumbeum* of Fries to be a British plant. "It grows on Falcon Clints, in Teesdale. Having had an opportunity of examining specimens of the Norwegian *Hieracia* during the past summer, partly by collecting personally, and partly through the kind assistance of Professor Blytt, of Christiania (from whom I have received a large dried collection), I am able satisfactorily to identify the above-mentioned plant, which has all the appearance of a good and *distinct* species. It is most nearly allied to *H. cæsium*, but differs strongly in having more truncate involucre, with *broad-based*, *acuminate*, *apiculate* scales, of a

dark colour, margined with green; also in the involucre and peduncles being almost or entirely *destitute of stellate pubescence*. *H. cæsium*, from the same place, and from Cronkley Scar, has narrow, *acute* involucreal scales, and usually a *large* amount of stellate down on the peduncles and involucre. *H. plumbeum* flowers *very early* (say about July), while *H. cæsium* is in perfection or nearly so in September. I have the plant in cultivation from Falcon Clints; and under these circumstances it becomes still more dissimilar. It agrees well with my Norwegian specimens, and still better than they do with the description in Fries's 'Monograph.'"

Mr. M'Nab read the following extract of a letter from Dr. Gilbert M'Nab, dated Jamaica, November 1, 1851:—"Some time ago I sent you some dried specimens of a small plant, which I supposed was a floating aquatic fern; but since I wrote you I have discovered what it is. In the water-tank in my garden is a very large and luxuriant plant of the *Nymphæa ampla*, which seeds very freely. The seeds are surrounded by a spongy-looking arillus, which floats to the surface all those that get disengaged from the mud, where the capsule is ripened; and whilst floating on the surface they there vegetate, and after a time sink and take root in the mud. The small, leaf-looking bodies are the submersed leaves of the plant; they are of a similar shape, but totally different in texture from the floating leaves. I also notice in the *N. ampla* what I have never seen in any of the family, *viz.*, that it produces as many purely male flowers as it does hermaphrodite. I have not yet seen any purely female flower, although I dare say I shall. I was thinking of putting some up in brine, as they may be interesting."

Mr. M'Nab also read the following extract of a letter from Mr. John Goldie, Ayr, Canada West (late of Ayrshire):—"I observed in the 'North British Agriculturist' that at one of your botanical meetings there was a discussion about what kind of trees were generally struck with lightning. Since I came here I have learned something on that subject. One morning no less than four trees were struck by lightning within three miles of this place, one of them close at hand. Of the four trees alluded to all were gigantic specimens of the Weymouth pine (*Pinus Strobus*). Indeed, I may say that I do not recollect seeing any other sort of tree being injured by lightning in this part of the country. Whether this occurs from the pine being taller and more pointed than any other of the trees here, or from any other cause, I shall not presume to say. In all the lightning-struck trees which I have examined the electric fluid proceeded from the top to the root,

following the grain of the wood, and cutting out the bark two or three inches in breadth all the way, as if it had been scooped out with a gouge."

Mr. M'Nab likewise laid before the meeting a list of temperatures, as observed by the thermometer in the Botanic Garden, from the 1st to the 9th of November.

The following papers were read:—

1. 'Notice of a New British Viola;' by Charles C. Babington, M.A. In this communication Mr. Babington stated that he had obtained a new species of violet from Mr. A. G. More, of Trinity College, Cambridge, who gathered it in June, 1851, in peaty ground in Garry-land Wood, near Gort, county Galway. Mr. Babington remarks that it is only recently we have learned, from the writings of Fries and of Grenier, to distinguish the several species of violet which have been confounded under the name of *Viola lactea*, Sm., and that we have discovered the necessity of separating those possessing rhizomes from the non-rhizomatous species. The species called *Viola stagnina* is the only known British representative of the former. The present species is allied to it, and is probably one of those with rhizomes. It is the *Viola stricta* of Hornemann; and the following are its characters:—Anther-spur short, broadly lancet-shaped, blunt, almost twice as long as broad; corolla-spur short, blunt, green; leaves cordate-ovate; petioles winged at the top; stipules oblong-lanceolate, leaf-like, inciso-serrate, ($\frac{1}{2}$) shorter than the petioles, 'on the middle of the stem;' primary and lateral stems flowering and elongated. The plant is far more nearly allied to *Viola stagnina* than to any of our other violets; but the green colour of the corolla-spur, the differently-shaped leaves, and remarkably different stipules clearly distinguish it. The short corolla-spur, and also that of the anthers, are sufficient to separate it from *Viola canina*.

2. 'On the Fuchsia, considered Morphologically;' by the Rev. Dr. M'Cosh, Brechin. The branches of the Fuchsia whorl round the axis. I have selected a species which whorls in threes. In this plant I find that the leaves also come off in triplets. I cut a freely-growing branch, and found it to have twenty-four branches, which, when measured, were as follows:—1st whorl, 63.56.60; 2nd whorl, 51.60.56; 3rd whorl, 63.60.58; 4th whorl, 60.57.60; 5th whorl, 58.62.62; 6th whorl, 65.60.57; 7th whorl, 85.62.60; 8th whorl, 58.60.58. The normal angle of the branches is therefore about 60°. On mea-

asuring the leaf I find it to be 50° . Any freely-growing branch would give substantially the same result. I now endeavoured to find whether the curve of the branchlets and the curve of the vein corresponded. The eye at once said they were the same; but I wished to have correct measurements. This I found to be difficult, inasmuch as the stems are so much larger than the veins, which renders it impossible directly to compare them. Thus it is exceedingly difficult to determine the relative length of the two, so as to take a proportional measurement. It occurred to me to try and find the law of the ordinates of the curves, and thus inquire if they corresponded, which I found to be the case, the result showing that the ordinates increased by equal increments in equal spaces, and that the increment is to the absciss. This, then, was the simple law of the curve of the branch. I then proceeded to examine the curve of the vein on the same principle, and found it to obey the very same law of equal increment in equal spaces. This seemed to me a demonstration of the identity of the curve of branch and leaf.

3. 'On Monstrosities of the Dandelion and common Clover, observed near Turin;' by Charles Murchison, M.D., British Embassy at Turin. In this communication Dr. Murchison noticed the occurrence of a peculiar state of the common dandelion, in which each of the ligulate florets was supported on an apparent stalk of its own, this stalk being hollow, and probably an elongated, abortive state of the fruit, as indicated by the pappus being at the apex. Some of the hollow stalks showed a tendency to adhere together. In another monstrosity of the same plant the flower-stalk divided, immediately within the involucre, into twenty-one tubular pedicels, some of them two inches long, each bearing a small cluster of tubular florets. The inflorescence thus had the appearance of a compound umbel rather than of a capitulum. A general involucre surrounded the pedicels, and a partial involucre existed at the point where the smaller heads of tubular flowers were given off. At the base of the pedicels, within the general involucre, a few sessile, ligulate florets were produced. The monstrosity of the common clover consisted in the conversion of all the parts into green leaves. Each little flower had a tubular calyx, divided into five unequal segments; and within this were from ten to twenty spathulate, green leaflets, supported on long stalks. The leaflets varied in length, from three to six or eight lines. The pistil protruded a great way beyond the flower, measuring sometimes an inch in length, and supporting a green leaf, either simple or variously

divided. Dr. Murchison noticed that many entire clover-fields in the neighbourhood of Turin scarcely contained a single head of flowers, and that the farmers there have this season complained generally of the failure of the clover-seed. The paper was illustrated by drawings and dissections.

4. 'On the Flora of Bonn, on the Rhine;' by G. S. Blackie, Esq. The author noticed some of the objects of interest, in a botanical point of view, in the neighbourhood of Bonn, including the Botanic Garden, and the Museum of Natural History at Poppelsdorf, remarking particularly upon the geological collection, containing many interesting specimens, some of which were from brown-coal pits at Friesdorf, three miles distant. "The stratum at Friesdorf is, in fact, a forest, buried at an exceedingly remote period, and now converted into brown coal. The trunks of trees lie in beds of clay and sand, and are found in various stages, from the perfect fossil tree, in which the form and structure are plainly visible, to this coal. The layers of coal alternate with layers of aluminous earth, which furnishes materials for a large alum work, on the same hill. This coal also yields the pigment known by the name of burnt umber, or Cologne earth. At Putzberg, near Friesdorf, trunks of trees ten, and even twelve, feet in diameter have been frequently found." The author then proceeded to remark:—"Bonn possesses a salubrious climate, severe winter, early spring, and very warm summer. It stands near the head of that immense plain which extends from the seven mountains to Rotterdam. There are no very high hills in the neighbourhood, except the Drachenfels and its six brothers, eight or nine miles up the river, though between Bonn and these seven mountains the country is gradually rising, and below Bonn there is hardly a hillock. Many of the smaller heights, if not covered by vineyards, are clothed with forests of short, stunted trees, and inhabited by deer, roe, and even, though very rarely, by the wild boar. The soil of the country is in general rich, though in many places very stony. The whole country has been formed by volcanic agency, and consists of lava, trachyte, and basalt; and one or two of the hills are plainly extinct volcanoes, more especially that of Rodeberg, which is opposite the seven mountains. This is one of the largest extinct volcanoes on the Rhine. It has a circular crater about a quarter of an English mile in diameter, and 100 feet deep; and great quantities of tufa and scorix are found in and around it. The country is under a high state of cultivation, and the hills are drained and cultivated to their summits. Many of

the fields yield two crops in the year. One great want is the entire absence of pasture, for all animals are fed at home, and never put out to graze. The appearance of the country, on this account chiefly, is curious to an English eye, as instead of fine, large fields, they have small patches of different crops, of one or two acres in extent, growing side by side, without hedge, fence, or tree, giving a patch-work appearance to the whole, which does not at all add to the picturesque character of the scenery, and indeed, after the fine trees and hedgerows of old England, makes the country look plain. These small crops, however, have this advantage,—that as in that country there are mostly small farmers, one crop failing they have one or two more to rely on.

“The chief plants cultivated near Bonn are rye, wheat, oats, barley, potatoes, cabbage (grown near the towns and villages, chiefly for *sauer kraut*), rich grasses and clover (for the cattle), *Ervum Lens*, the hop (*Humulus Lupulus*), *Valerianella olitoria*, *Brassica oleracea*, *Rapa* and *Napus*, buckwheat, hemp and flax (rarely), and the vine; and among cultivated trees *Robinia Pseud-Acacia* (brought from North America) and *Æsculus Hippocastanum* (introduced first at Vienna, from the East Indies, in 1575) are most universal. It is astonishing to remark the perseverance and diligence with which the vine is cultivated. On the almost perpendicular banks of the Rhine, between Mayence and Coblenz, or nearer Bonn, the steep heights of the valley of the Ahr are cultivated to their summits, soil being carried up the rocks by means of ladders, and placed in baskets fixed on ledges of the rock, and then dyked round, lest the wind and rain should carry off the plants. In this Ahr valley there are hills higher than Arthur’s Seat, cultivated to their peaks in this way, a specimen of industry rivalling even that of the sands of Holland.

“The vine is not properly a native of this country, having come from the southern parts of Europe; but it has in some places escaped from cultivation, and appears wild, and is even held to be so by some authors.

“Further up the Rhine, towards Mayence and Frankfurt, the climate is warmer; and, on account of the absence of heights, the cultivation of the vine almost ceases, while tobacco and Indian maize are grown in abundance. Some authors think that *Nicotiana Tabacum*, *latissima*, and *rustica*, are true natives of the Rhine’s course; but I fear that, like the vine and other plants, they have been introduced for cultivation, and have now and then escaped. My specimens of this plant were collected on the banks of the Maine, near Frankfurt,

far from any tobacco plantation. The only difference which it seems to bear from the cultivated plant is in height, a circumstance easily explained. Though much tobacco is grown on this part of the Rhine, the greater part of that smoked in Germany comes from Holland, where the rich, damp soil is very favourable to it, though it very soon exhausts a soil.

“ I commenced my excursions early in May, immediately after my arrival in Bonn, the first being made to the Kreutzberg, a sacred, wooded hill, a mile or two distant. In the woods here I found that all the earlier flowers—the hyacinth, anemone, celandine, periwinkle, and the like, which had hardly flowered when I left Scotland—were gone, and were succeeded by a new series, the woods being full of the lily of the valley (*Convallaria majalis*) and Solomon’s seal (*C. multiflora*), and also, in great abundance, an entire stranger, which I found to be *Maianthemum bifolium*, DC. *Phyteuma nigrum*, a species not found in Britain, was the next observed, and is distinguished by its dark violet flowers and linear bracts. *Erica Tetralix* was already pretty frequent. *E. cinerea*, on the other hand, is very rare, the only authentic habitat for it in North and Middle Germany being at Dollendorf, near Bonn; but there it is now extinct, having been carried off by botanists. *Ulex Europæus* also, though found at Holstein, Hamburg, and Bremen, is not found so far south. The next plants I found were *Valerianella olitoria* and *carinata*, and *Genista pilosa*, distinguished by its want of thorns, its woody stem, hairy pods, and under side of leaf silky. All the vineyards were full of *Ornithogalum umbellatum*, and, growing along with it, *Euphorbia Cyparissias* and *Esula*, *Holosteum umbellatum*, and *Asclepias vincetoxicum*, L. The latter is common in Germany. On the hills I also found *Lithospermum purpureo-cæruleum* and *Cerastium brachypetalum*, two plants characteristic of the flora. The *Cerastium* is readily distinguished by its grayish-green colour, with long, gray hairs, and flower-stalks two or three times longer than the calyx.

“ Later in the month I visited the Drachenfels, and the rest of the seven mountains. On the summit of the first I found *Alyssum montanum*. *Alyssum calycinum* also is universal over the country, and almost as common as *Sisymbrium officinale*, and grows commonly to about one-half or three-fourths of a foot, and frequently to a foot and upwards.

“ In the woods were *Lonicera Xylosteum* (in great abundance), *Paris quadrifolia* (often with five or six leaves), *Euphorbia dulcis* (a rare species), *Rhamnus Frangula*, and *Plantago media*. In the immediate

vicinity of Bonn I found *Trifolium incarnatum*, *Hydrocharis Morsus-Ranæ*, *Iris sibirica*, *Orchis Morio*, *Euphorbia platyphylla*, *Genista germanica*, *sagittalis* and *tinctoria*, and *Carex Oederi* and *Schreberi*.

“As the month of June came in the rocks and walls were covered with various species of *Sedum*, of which *S. album* was the most common; and six or seven species of *Campanula* came in flower. Near Rheineek I then found *Asarum Europæum* and *Helleborus fœtidus*; and near Bonn, *Aristolochia Clematitis*. The lochs were covered with the white and yellow water-lilies; while *Villarsia nymphæoides*, *Sagittaria*, and other water plants were in great abundance. The species of *Orobanche* began to flower in June. *Orobanche major* I found in almost every wood, being parasitical on the common broom, and particularly abundant up the side of Drachenfels, where it grew on every broom bush. The same was the case at Siegburg. *O. minor*, parasitical upon *Trifolium medium* and *pratense*, is much rarer, though I found it more than once on the Rhine. At Obercassel, in the immediate vicinity of Bonn, on a stony bank of the Rhine, grew two other species, *O. amethystea* of Thuillier, or *Eryngii* of Duby, and *O. Epithymum*. These are perhaps the two rarest German species. The former, parasitical upon *Eryngium campestre*, is characterized chiefly by from three to six nerves on the calyx, and a tubular corolla, curved immediately from the base, otherwise straight; and the latter, a parasite on thyme, has the lowest lip of the corolla twice as large as those at the side, besides curious hairs on the stigma. *O. Hederæ*, parasitical upon ivy, by many of the Germans considered a mere variety of *minor*, I found in the vicinity.

“I likewise obtained some interesting *Orchideæ*, but am sorry that I did not find *Cypripedium Calceolus*, having only once met with a withered specimen. At the same place I found *Ophrys arachnites* and *muscifera*, together with *Herminium Monorchis*, *Cephalanthera pallens*, and *Orchis militaris*. Near Bonn I also found the bug *Orchis* (*Orchis coriophora*). At this time I found several very late specimens of *Anemone Pulsatilla*, *Delphinium Consolida* (truly wild), *Coronilla varia*, *Stachys recta*, *Sisymbrium Sophia*, *Arnica montana*, *Spergula pentandra*, and many others. The banks of the Rhine were for miles covered with *Allium Schœnoprasum*. *A. victoralis* I found only once. I also found a specimen of *Monotropa Hypopitys*, but am not in a position to reconcile the disputes respecting its reputed parasitism. I found other plants worthy of notice: *Valerianella auricula* and *Morrisonii*, *Polygala depressa*, *Hippocrepis comosa*, and *Mespilus germanica*.

“The month of July came, and with it the evening primrose (*Oenothera biennis*), which covered the shores of the Rhine and other rivers; also, though rarely, another species of *Oenothera* (*muricata*), having the lower leaves lancet-shaped. None of the species are natives of Europe, having been brought from Virginia, about 1614, and, escaping from gardens, appeared universally over the country, and now have the appearance of true natives. *Euphorbia Gerardiana*, *Dianthus prolifer*, *Armeria*, and *Carthusianorum* were now in abundance. The latter I have noticed seems to prefer particularly a soil of volcanic tufa, for wherever the tufa lies there I have constantly found the plant in most quantity. This is probably, however, only a coincidence. The species of *Verbascum* were also numerous around Bonn. I found *V. Thapsus*, *Thapsiforme*, *nigrum*, *Blattaria*, *Lychnites*, *nigro-floccosum*, and *Thapsiforme-floccosum*. *Digitalis ochroleucum* I found now and then rarely. On the tops of high hills I occasionally observed *Bupleurum longifolium*, and once *B. rotundifolium*. Along the shores of the Rhine near Bonn I picked *Herniaria glabra*, *Corrigiola littoralis*, *Saponaria vaccaria*, and *Calla palustris*. About this time, too, the beautiful heads of *Helichrysum arenarium*, with which tombs are decked here, as well as in France, began to appear, accompanied frequently by *Inula Britannica*. *Lepidium ruderales* and *graminifolium* flower also at this time.

“Towards the end of my stay I looked at the ferns of the country. Of these there are a good number, but only one species (*Struthiopteris germanica*) that we have not in Britain, which, however, I did not find till my last day in Bonn. The ferns, generally, are not distributed so plentifully as in Britain. *Osmunda regalis*, *Ophioglossum vulgatum*, and *Scolopendrium vulgare* are pretty frequently found. *Asplenium septentrionale* is very common, much more so than *Ruta-muraria* or *Trichomanes*. I found five *Lycopodia*, *L. alpinum*, *clavatum*, *Selago*, *inundatum*, and a common one there, though a stranger to us, *L. chamæ-Cyparissias*. I got the rare *Woodsia hyperborea* far up the Rhine, in the vicinity of Bacharach.”

Mr. Blackie exhibited specimens of the more interesting species, and presented to the Society's library a MS. catalogue of all the plants observed by him during his three months' stay in the neighbourhood of Bonn, which contains 586 Dicotyledones, 175 Monocotyledones, and 28 Acotyledones, making a total of 789 species.

5. ‘Microscopical Observations on a kind of Paper made from Vegetable Tissue,’ by John Matthews, Esq. Mr. Matthews stated that he had examined the specimen of paper presented at the last meeting

of the Society, and found that it exhibited beautiful cells, with stomata. It was therefore the cuticle of a plant; and from the quadrangular stomata he was disposed to think that it was allied to Agave.

Office-bearers were elected as follows for the ensuing year:—President: Dr. Seller. Vice-Presidents: Professor Fleming, Dr. Parnell, Professor Balfour, and Professor Christison. Councillors: Professor Goodsir, Mr. James Cunningham, Mr. William L. Lindsay, Mr. James M'Nab, Mr. R. M. Stark, Dr. Lowe, Dr. Dobie, Mr. Charles Lawson, jun., Mr. Henry Paul, and Mr. W. O. Priestley. Honorary Secretary: Dr. Greville. Foreign Secretary: Dr. Douglas MacLagan. Auditor: Mr. Brand. Treasurer: Mr. Evans. Curator of the Museum: Mr. Thomas Anderson. Assistant Secretary and Curator: Mr. G. Lawson.

The following gentlemen were elected Fellows:—The Rev. George M'Farline, Elizafield; Charles Jenner, Esq., Holland Lodge; William Somerville Millar, Esq.; James Shorrock, Esq.; Charles Dyer, Esq.; and John Matthews, Esq. Mr. James B. Davies was elected an Associate.

Several candidates were proposed for election at next meeting.

Botanical Society of London.

*Saturday, November 29, 1851 (fifteenth Anniversary Meeting).—*Thomas Moore, Esq., F.L.S., in the chair.

Donations of British plants were announced from Mr. Hewett C. Watson, Mr. H. O. Stephens, the Rev. W. W. Hind, Mr. J. D. Salmon, Mr. T. Dutton, the Rev. A. Bloxam, the Rev. H. P. Marsham, and Mr. G. E. Dennes.

The Secretary read the annual Report of the Council, from which it appeared that 17 new members had been elected since the last Anniversary Meeting, and that the Society consisted of 267 members. Great exertions had been made by the Herbarium Committee to obtain the rarer and more interesting plants; and many valuable specimens had been received for distribution to the members. Great progress had been made by Mr. Syme, the Curator, in arranging the Society's collections. The Report was unanimously adopted, after which a ballot took place for the Council for 1852, when J. E. Gray, Esq., F.R.S., was re-elected President; Mr. J. Reynolds, Treasurer; Mr. T. Moore, Librarian; and Mr. G. E. Dennes, Secretary.

Sir Coutts Lindsay, Bart., Mr. J. D. Salmon, and Mr. J. P. Norman were elected new members of the Council.

Friday, November 5, 1851.—Arthur Henfrey, Esq., F.L.S., V.P., in the chair.

The following donations were announced :—‘Proceedings of the Liverpool Literary and Philosophical Society,’ No. 6 ; presented by the Society. ‘Proceedings of the Portsmouth and Portsea Literary and Philosophical Society ;’ presented by the Society. ‘Report of the Seventh General Meeting of Subscribers to the Lynn Museum ;’ presented by the Rev. J. Bransby. ‘Journal of the Statistical Society of London ;’ presented by the Society. ‘Pharmaceutical Journal and Transactions ;’ presented by the Pharmaceutical Society. ‘The Gardener’s Magazine of Botany ;’ presented by the Editors. ‘Memorias de la Real Academia de Ciencias de Madrid ;’ presented by the Academy. British plants from Mr. R. Withers, Mr. J. Tatham, Rev. T. Butler, Mr. G. S. Gibson, Mr. J. Whittaker, Mr. J. G. Baker, Mrs. James, and Mr. J. T. Syme.

The Chairman exhibited German specimens of *Equisetum inundatum*, *Lasch.*, considered by German botanists as a hybrid between *E. limosum* and *E. arvense*.

Mr. J. T. Syme (Curator) read a notice of *Sparganium natans*, “*L.*” *Fr.*, which he considered distinct from *S. minimum*, “*Bauh.*” *Fr.*, the plant commonly called by the former name. He remarked that Mr. Babington’s descriptions of these two plants, in the third edition of the ‘Manual of British Botany,’ pointed out the distinctive characters of each so clearly, that there was nothing of importance left to notice. He stated that he had seen the plant growing in several places in Braemar, in the Loch of Drum, Aberdeenshire, and near the Spittal of Glenshee, in Perthshire ; he had also seen specimens collected by Mr. H. C. Watson, in Inverness-shire, and on Purbright Common, Surrey, and some, dated 1808, which had been gathered by the Rev. D. Fleming, in Featholand Lake, North Mavine, in the mainland of Zetland. Mr. Syme presented a set of specimens of the plant to the herbarium of the Society.—*G. E. D.*

Notice of 'A Manual of Botany; being an Introduction to the Study of the Structure, Physiology, and Classification of Plants. By JOHN HUTTON BALFOUR, M.D., F.L.S., F.R.S.E., Professor of Medicine and Botany in the University of Edinburgh. Second Edition. London: John Joseph Griffin & Co. 1851.'

Also, a Review of the above, received as a kind of Handbill, but published in the 'North British Agriculturist,' dated Wednesday, May 7, 1851.

Also, a second Review of the same work, published in the 'Monthly Medical Journal of Botany' for June, 1851.

Also, 'Singular Specimens of the Edinburgh Practice of Criticism. By JOHN JOSEPH GRIFFIN. London: John J. Griffin & Co. 1851.'

Also, 'Letter to R. K. Greville; being an Answer to certain Statements contained in a Pamphlet intituled 'Singular Practices,' &c. By JOHN HUTTON BALFOUR, M.D. Edinburgh: Adam & Charles Black. 1851.'

THE volume of which the title stands at the head of the foregoing list was fully, fairly, and favourably reviewed in the 'Phytologist,' as far back as July, 1849. The second edition differs from the first scarcely at all. There are a few alterations, it is true, but these consist almost entirely in the correction of unimportant errors of grammar and orthography, and a few of what among printers generally pass by the name of "literals."

Besides these trifling corrections, there is one, and only one, marked improvement, and that is the location of the Rhizanth. In the first edition this debatable group stands as order 163, between 162 Nephenthaceæ and 164 Datisceæ, the three orders (162, 163, 164) being placed between two others, which will probably be more familiar to many English botanists, namely, Aristolochiaceæ and Empetraceæ. To all these four orders the Rhizanth have but little external or structural resemblance. In the second edition the Rhizanth are placed between the Endogens and Acrogens, the orders being numbered 210 Gramineæ, 211 Rhizanthæ, and 212 Equisetaceæ. By general consent the Rhizanth hold a dubious position in technical classification, having characters, as all systematic botanists agree, intermediate between the phanerogamous and cryptogamous plants, though, on the whole, considerably nearer the former. This improvement is one of botanical importance, and exhibits the editor of the second edition as a more profound and trustworthy systematist than the author of the

first. Yet an unfortunate error, either of the pen or press, has marred the good effect of this improvement: the short line, "Subclass 4. Rhizanthæ," required before the name of the order Rhizanthæ, is omitted. Through this omission the Rhizanthæ are made to appear as a third order of the subclass Glumaceæ. This blunder is really of a serious character in a manual for students, because likely to cause confusion of ideas. But that it is a mere casual blunder is quite clear, since the intentional introduction of Rhizanthæ into the Glumaceæ would imply an amount of ignorance on the part of the editor which is inconsistent with the greatly-improved position of the order, and which is nowhere displayed throughout the volume. If, therefore, the first edition was worthy the commendation the 'Phytologist' bestowed on it, the second is still more worthy of that commendation, since it possesses all the merits, but not all the faults, of the first; and this observation, be it understood, is made advisedly, and after referring to the various passages which the *soi-disant* critics have been pleased to cite as erroneous. Since, therefore, we cordially recommended the first edition of the Manual, and since we adhere to that commendation, as justified by the work itself, so it follows that the second edition, being an improvement on the first, has our cordial commendation also. We believe that a careful comparison of the Manual with Jussieu's 'Cours Élémentaire' and Lindley's 'Elements' would rob the first of any very strong claim to the standing of an original work; still Dr. Balfour's share in the work is very creditable, and fully sufficient to warrant its bearing his name.

Having in these few words disposed of the work itself, we are bound in etiquette to notice the reviews, those paper pellets which the pop-guns of Scottish critics have propelled into our sanctum. Of the first of these, the review signed "Z.," we have received no less than five copies, all of them printed as separate handbills, and kindly intended, no doubt, to save us the trouble of forming or expressing any views of our own. But if this were the object it has entirely failed, since we found something so curious in these effusions, that we would fain inquire, What is it all about? How is it that our Edinburgh friends, the especial friends, too, of Dr. Balfour, have so unmercifully belaboured that gentleman's *book*, while they speak of *him* as an injured man,—a man, it would seem, injured by the badness of his own book? Poor Professor! If thy reviewers could but have foreseen the effect produced by so industriously ferreting out the errors of thy book, they would surely have refrained from charging thy editorial successor with leaving thy blunders uncorrected! Well mayst thou exclaim,

“Preserve me from my friends !” It has never been our lot to see the errors, the unimportant errors, of a book so elaborately hunted out and exposed, and yet all through good will to the author ! And then they slyly inform us that the errors still deface the work ; not new errors, but the author’s old, original blunders. What bitter sarcasm ! The enunciation of these critics, stripped of verbiage and circumlocution, amounts simply to this :—

1st. That Dr. Balfour’s Manual teems with blunders, which the new editor has not corrected.

2nd. That the new editor has not worked up his subject to the present time.

3rd. That the new editor has misplaced the Rhizanth.

In reference to the first of these charges, we unhesitatingly admit that many corrections have been, and more might have been, made, and ought to have been made.

On the second point we also admit that much has been left undone. We would however observe, that had the new edition contained any new matter it would have been scarcely fair that Dr. Balfour should have the blame or praise, since his name stands as sole author in both editions, and since, whatever may have been said to the contrary, it is perfectly clear that the book was and is his own production.

On the third point, the location of the Rhizanth, the critics either know that the location is improved, or they are ignorant of botany. If the first, they have forfeited all claim to respect, by their comments on the subject ; if the last, they have no right to express any opinion at all.

These reviews, emanating, as they do, from critics avowing the most friendly feeling for Dr. Balfour, and subsequently appropriated almost entirely by the Doctor himself,* call forth a rejoinder from Mr. Griffin, the real proprietor of the work. This gentleman appears to us to have selected a most unfortunate title for his pamphlet, for it, in fact, conveys to the mind of the reader no idea whatever of the matters which it would reveal. From this pamphlet it appears that a long and angry correspondence has been carried on between the author and the proprietor of the Manual about the copyright of that work, and that the reviews which we have just noticed are penned in a spirit of hot partisanship, so hot, indeed, that, as we have already shown, they overshoot the mark, and damage, albeit unintentionally, the very man their authors are so eager to serve. As we are unable to compliment Mr.

* ‘ Letter to Dr. Greville,’ pp. 19—24.

Griffin on the title he has chosen, so neither can we speak highly of the pleading of his own cause. However, Dr. Balfour's rejoinder serves to supply some of the missing links in the chain of evidence; and these, from a careful comparison of all the facts that remain, after dismissing the doubtful or unproved assertions, are as follow:—

Mr. Griffin, of the house of J. J. Griffin & Co., of 53, Baker Street, Portman Square, conceived the idea of publishing a series of cheap manuals on the natural sciences, and proposed to Dr. Balfour that he should write that on botany, provided Mr. Griffin, then on his way to Paris, succeeded in purchasing the cuts used in the French edition of Jussieu's work.

"The knowledge, possessed by both of us," says Mr. Griffin, "that the French publisher had *hawked* some of his casts too much in England, rendered it expedient that I should make certain inquiries before buying them at all. It was agreed, that if I bought them I was to let you know immediately, that you might proceed with the work, and have it ready for use the next season. But, whether you should, or should not, write the work, was left entirely contingent upon the fact, whether I did, or did not, purchase the casts of the cuts of Jussieu's Manual. It was not the case, that you were, *at all events*, writing a Text-book, of which I was to have a license to print an edition; but it was the case, that I was projecting a *series* of publications, on one of which you were to work, provided that, on my arrival in Paris, I should still think it expedient to carry the project into execution. If I had failed in obtaining the engravings, your Manual certainly would not have been written for me, and, perhaps, would never have been written at all. To such an extent was the enterprise *mine*—not *yours*." —*Singular Specimens*, p. 5.

Mr. Griffin purchased the botanical cuts of the French work, and agreed with Dr. Balfour to furnish the letterpress, for the sum of £200. But for what?—the copyright or an edition?

Mr. Griffin says:—

"When I planned the work, provided the cuts, and offered you £200 to translate Jussieu's treatise, it was, of course, in order that I might acquire the copyright. I never agreed to pay £200 for leave to print *an edition* of your Text-book. *You had no text-book* at the time, and it was not stipulated whether I should print 1000, 2000, or 20,000." —*Singular Specimens*, p. 5.

Dr. Balfour says, in reference to this passage:—

"It is not pretended, that in the negotiations between Mr. Griffin and myself, anything was said on the subject of copyright. What

that gentleman's expectations may have been on that subject, I have no means of knowing. I can only answer for myself, that I never contemplated parting with the copyright of the work."—*Letter to Dr. Greville*, p. 3.

But, notwithstanding his doubts on this matter, Dr. Balfour actually signed the following receipt, and received the £200 :—

“Edinburgh, 9th April, 1850.

“£200 : 0 : 0.—Received of John Joseph Griffin and Charles Griffin, publishers in London, the sum of Two Hundred Pounds Sterling, on the terms that I assign to them, as I hereby do, my interest in the copyright of a work entitled, ‘A Manual of Botany,’ founded on the model of De Jussieu’s ‘Cours Élémentaire de Botanique,’ and consisting in part of a translation of that work undertaken at their request ; and I authorize them to publish the said work, on their own account, in any manner they think fit, and to enter themselves in the Registry Book of the Stationers’ Company of London, as the proprietors of the said copyright.—(Signed) J. H. BALFOUR. (Signed) I. BAYLEY, of the City of Edinburgh, Solicitor, *Witness* ; WM. GAYLOR, of the City of Edinburgh, Clerk to the above Isaac Bayley, *Witness*.”—*Singular Specimens*, p. 5.

• Dr. Balfour admits this transaction, and adds :—

“This receipt was transmitted to Mr. Griffin ; and the £200 originally agreed on was at last paid to me. Indeed, I saw clearly that I must either forego the copyright, or maintain it by a lawsuit ; and it need scarcely occasion surprise, if I preferred the former alternative, even although I had received a decided professional opinion that the view which I had taken as to my legal rights was the correct one. Accordingly, my solicitor, in transmitting the receipt, expressly stated in my name, that when I wrote the Manual, I had not the slightest intention of parting with the copyright, and by no means conceived that I did so by anything which had previously passed between Mr. Griffin and me.”—*Letter to Dr. Greville*, p. 7.

This may be very true ; but it is not customary in London, whatever it may be in Edinburgh, to give an author £200 for a cheap book without the slightest intimation on either side that an edition, and not a copyright, was intended, and, if the former, without a word as to the amount of that edition. There is great astuteness, we might almost say acuteness, shown by both parties throughout the transaction ; the lawyers are perpetually at their elbows ; it is like an elaborate and protracted game of chess played by letter. And it seems perfectly incredible that two such disputants, and so assisted, should

have contemplated a mere edition, without introducing that restriction, in any manner whatever, into their correspondence. Neither London, nor, we should imagine, Edinburgh booksellers conduct their business in quite such a slovenly manner. However, the edition is sold out; and then Mr. Griffin, as we consider, handsomely, offers Dr. Balfour £100 to edit a second. So says Mr. Griffin; and Dr. Balfour fully admits it.

“It is quite true that he offered me at one time £100 to revise and edit a second edition of the Manual, of which, however, he was to retain the copyright. And another of his proposals was, that I should receive for editing a second edition £50, and for a third, one shilling per volume on all that were printed, and that at the end of three years after the publication of this third edition, the copyright should be assigned to me gratis. It is to be observed, however, that this last proposal (which was the only one holding out any prospect of my ever regaining the copyright) was trammelled with the condition that Mr. Griffin should be entitled to bring out the work in the ‘*Encyclopædia Metropolitana*,’ with no restriction upon the number of copies to be so published.”—*Letter to Dr. Greville*, p. 8.

To this “trammelling” Dr. Balfour objects; and, it being found that no agreement was likely to be made, Mr. Griffin at length employed another editor; and the work we are now noticing is the result. In some of this correspondence there is a discrepancy as regards facts. Mr. Griffin asserts that Dr. Balfour engaged to use the Manual as his text-book in teaching; but this Dr. Balfour emphatically denies. On this question the looker-on can only be guided by appearances; and these are in favour of Mr. Griffin, for Dr. Balfour, until the disagreement, did actually use the Manual in teaching, and did actually promote its circulation, just as though such use and advocacy did positively form a part of his agreement. He, however, takes umbrage at the publication, in his name, of a second edition, which he did not edit, being, perhaps, already predisposed to take offence from the contest about the copyright, and both ceases to use the Manual himself and endeavours to prevent its use by others. He also advertises another work by himself, evidently in order to render it a substitute, in his own and other class-rooms, for that which he had sold to Mr. Griffin for the £200.

We scarcely know how to blame Mr. Griffin for publishing, in Dr. Balfour’s name, an edition containing improvements which that gentlemen not only never suggested, but still ignores; for how could Mr. Griffin give the name of another botanist to a work entirely compiled

by Dr. Balfour? Surely that would have been a greater wrong to Dr. Balfour than the conferring on him the authorship of a few obvious improvements. Every one, unacquainted with the circumstances of the case, will give Dr. Balfour the unearned reputation of producing a better and more perfect book than he has hitherto either written or edited; in fact, he actually enjoys the reputation, among the casual purchasers of the second edition, of being a better botanist than he is.

Advice is the abundant raw produce of fools, the rare and highly-finished manufacture of the wise. Our advice is rarely given; but the inundation of documents on this subject would imply that here it is required. It is this:—Shake hands and be friends. Let Mr. Griffin retain the copyright: he has bought it, and is entitled to it. Let Dr. Balfour edit every edition hereafter published, and let him receive one shilling for every copy sold: he is entitled to it. Let him never think of disavowing his own book because another has improved it: to do so were ungenerous. Let him never think of remodelling and making another market of that which he has sold: this were—something worse than ungenerous. The Manual must always be sold as Dr. Balfour's: it was his originally, and must remain his, so far as the public is concerned, for ever.

Φιλαληθης.

Note on some further Stations for Leersia oryzoides.

By A. W. BENNETT, Esq.

I HAVE the satisfaction of being able to report that this rare and interesting grass is not confined to one spot in this immediate neighbourhood. Since it was first noticed at Brockham Bridge we have detected it in two other spots, one lower down the stream, beneath the ruins of Betchworth Castle, the other considerably higher up, not far from Betchworth Bridge. In both these stations it occurs in small tufts, compared with its abundance where first observed at Brockham Bridge. It has there, as, we suppose, is usual at this season, been cut down along with the rushes with which it was growing, and nothing is now to be seen of it. These additional stations are sufficient, however, to establish its range, and, in connexion with H. C. Watson's discovery of it near Moulsey (see Preface to Phytol. for 1851, p. xix), render it probable that it is to be found in the still, muddy basins of the Mole, all the way from above Reigate to its mouth.

A. W. BENNETT.

Brockham Lodge,
16th of 12th mo., 1851.

Note on Athyrium Filix-fœmina, var. latifolium.

By F. J. A. HORT, Esq.*

IN the November number of the 'Phytologist' Mr. Newman has signified his present opinion that "three new species and three new genera" ought to be added to our list of British ferns. One of the former is a very singular plant from the neighbourhood of Keswick, briefly noticed by both Hooker and Babington in their last editions as a variety of *Athyrium Filix-fœmina*, but now identified by Mr. Newman with the *Athyrium ovatum* of Roth. As that eminent pteridologist has merely published his results without elucidatory remarks, and has requested any observations which may assist him in preparing the forthcoming edition of his 'British Ferns,' I wish to state the reasons which have induced me, after seeing this plant growing at Keswick, to decide against its distinctness from the common lady-fern. They have been already communicated to him privately, but some of the facts involved seem to deserve publication. Mr. Babington informed me some months ago of his opinion that *A. ovatum*, Roth, is not identical with our plant, as he had formerly imagined. Having obtained from him a reference to the necessary authorities, I may conclude with a few remarks on the synonymy.

In the first place, only two tufts of our plant have been discovered, one on each side of the same hedge: and indeed there is but one now remaining, as the Hon. Miss Bickersteth removed the other some time ago. Miss Wright has repeatedly searched the district, but has not (or at least had not in 1849, when I visited the spot) succeeded in finding anything at all similar. Now Fries states that he has not admitted into his catalogue of Scandinavian plants any species of which he has not seen at least a hundred living individuals. Such a rule would be quite inapplicable to a fragmentary flora like that of Britain in the case of plants already distinguished in other countries; and, even where an altogether new species is proposed, the number required is perhaps excessive. But surely in this latter case a reasonable and moderate standard ought to be set up; and no one, I presume, would fix it so low as to admit a plant of which but two roots are known to exist. Apart, however, from this abstract consideration, there are some suspicious circumstances connected with the locality, which ought to be taken into account in weighing the evidence. I

* Reprinted from the 'Botanical Gazette' for December, 1851, by the kind permission of Mr. Henfrey and Mr. Hort.

fully grant the conspicuous difference of appearance and characters in single fronds ; and this difference is as apparent in a living as in a dried state, at least so far as I could judge in the ragged condition of the tuft, which seemed to have been wantonly lashed by the walking-stick of some non-botanical tourist ; though the growth of the whole plant is precisely like that of our common *Athyrium*. Further, the same hedgebank abounds with lady-fern of the ordinary form, and I searched in vain for intermediate states. But, on the other hand, this hedgebank bounds a somewhat boggy field, closely adjoining a deep bog. Another hedgebank of the same field produces a very fine and curious variety of *Lastrea dilatata*, having the lower pinnæ greatly dilated and turned round so far that their plane is nearly perpendicular to that of the general frond. Now here is an obvious instance of what is probably a frequent occurrence, that is, a remarkable change in the development of the fronds of ferns caused by the presence of bog-earth. Of course the change does not take place universally, and, even where it does take place, I do not suppose it to be uniform. On the contrary, this abnormal growth (for so it must be called) appears to be quite arbitrary and capricious. I cannot refrain from expressing somewhat more than a suspicion, that not *Lastrea uliginosa* only, but also *L. cristata* will ultimately be found to be mere varieties of *L. spinulosa* growing in bogs. A friend, who has visited the Lynn station for both the former plants, tells me that their relative quantities differed considerably from what a resident botanist had led him to expect ; which looks as if one were convertible into the other : and I have further learned from him the remarkable fact, that *L. cristata* has its pinnæ turned round precisely as in the above-mentioned variety of *L. dilatata* which grows in the boggy hedgebank near Keswick. On the whole, therefore, notwithstanding the occurrence of the typical lady-fern in close proximity, the curious appearance of our plant may not unreasonably be referred to the action of the soil. Hooker and Arnott speak of "intermediate states" from Kamtschatka and Crete : Mr. Babington possesses a specimen from the latter locality, belonging to the same (Heldreich's) collection. It is by no means satisfactory, being quite young and imperfectly developed, but it is precisely intermediate between the forms *latifolium* and *molle*, and resembles some young plants which have been raised in the Cambridge Botanic Garden from spores of *latifolium*. On the whole, I regard the Keswick plant as an accidental state (not a variety) of *A. Filix-fœmina*, bearing nearly the same relation to the typical variety that the state *trifidum* (as I understand it) bears to the var. *molle*.

The question of the synonymy is difficult to treat satisfactorily, from the unavoidably slippery nature of the descriptions. In one important respect Roth's account of his *A. ovatum* agrees substantially (though it hardly goes far enough), namely, in the breadth and close approximation of the pinnules; but their segments in our plant are not "truncate" and "as it were retuse at the apex," and their teeth are not "short and somewhat obtuse," but long, flexuous, and narrowly acuminate. The question is however virtually settled by Roth's reference to figure 3 of Müller's '*Flora Fridrichsdaliana*' as "optima!" Mr. Newman can hardly have seen this figure, for it is utterly unlike *latifolium* (especially in the dentition), but well represents a stout form of the var. *molle*, approaching the typical lady-fern: I have a specimen from Cockshott Wood near Keswick, of which it is an exact copy. Mr. Newman is himself the only fully competent judge of his second conclusion, that our plant "is the *Athyrium Filix-fœmina*, var. *dentatum*," of his '*British Ferns*:' I can only say that his description would not have led me to that result. His third conclusion, "that it is the *Athyrium latifolium* of Presl," seems to rest on very slight foundations, for Presl gives not a word of description, and his figure, which represents only a magnified fragmentary pinnule, might stand for anything. Probably the singular identity of the name with that given by Mr. Babington drew Mr. Newman's attention; but, as a matter of fact, the former gentleman had not noticed Presl's name till quite lately. If however our plant proves to be merely an accidental state of *A. Filix-fœmina*, the question of nomenclature will become of very little interest.

F. J. A. HORT.

Trinity College, Cambridge,
November 12, 1851.

Note on certain doubtfully native Plants.

By JAMES BLADON, Esq.

I WAS very much pleased with Mr. Lees (*Phytol.* iv. 56) taking up the cudgels so strongly in favour of some of our native plants that are undoubtedly so (if any plants are to be called really native, and not imported). He refers to Herefordshire for the columbine. In this neighbourhood I can find it nearly half a mile distant from *any* house, both in its proper purple colour, and the white and pale pink varieties, in the same piece of waste ground. I can also remember,

when a child, gathering it, with other wild flowers, far distant from houses, both in Staffordshire and Derbyshire, but not so frequent as it is in this neighbourhood.

Another of the plants alluded to by Mr. Lees is *Saponaria officinalis* (known here as "farewell summer"). I can refer to beds of it as much as eight or ten feet long by four or six feet wide, in some places approaching to the double form (*flore pleno*); in fact, it is so very common in some districts here, that it is hardly thought worthy of a place in a garden, the reason being *it is such a common flower*.

In addition to the plants already mentioned, permit me to make a claim for the birthright of a universal favourite with old or young, male or female, botanist, florist, or what not: none can behold it without pleasure:—

"Already now the snowdrop dares appear,
The first pale blossom of the unripen'd year."

"Earliest bud that decks the garden,
Fairest of the fragrant race,
First-born child of vernal Flora,
Seeking wild thy lowly place.
White-robed flow'r, in lonely beauty
Rising from a wintry bed,
Chilling winds and blasts ungenial
Rudely threat'ning round thy head."

If distance from houses, gardens, or brooks is required to establish a claim for aboriginal plants, I can produce the most decisive proofs. It is found in fields on the crest of a spur of the mountain (which separates two valleys), about a mile in length, and at the upper end, where it adjoins the mountain, is at least a mile in width from rivulet to rivulet. The only houses on the hill are a farm-house, *at least half a mile below* the fields where they are found, and one rather nearer, built about twenty-five years ago, on the opposite declivity. Formerly there was a cottage about half way between the farm-house and the locality. One of the fields abuts upon a wood that has never yet been brought into cultivation. So much for one locality. Another is the hedge-bank of a country lane, the nearest cottage not within a quarter of a mile, and *below* it. I have personally known it introduced *into* gardens from its native localities. If the above evidence is not sufficient to establish the native habitation of a plant, I know not what would be required.

JAMES BLADON.

Pont-y-Pool, December, 1851.

On the Abundance of certain Fungi on Worlebury Hill, Weston-super-mare, in the Autumn of 1851. By EDWIN LEES, Esq., F.L.S.

HAVING been led to spend a week at Weston in the month of October last, I paid several visits to Worlebury Hill, well known to antiquaries for the ruins of an ancient fortification upon it, long encompassing mounds of broken carboniferous limestone, yet remaining very prominent, among the crevices of which the *Rubia peregrina* takes firm hold, and spreads about luxuriantly; and the *Ceterach officinarum* dots with its pretty fronds the fragmentary stones once guarded by stern warriors.

This hill is now planted with firs and larches, and has therefore lost its primitive aspect of a bare, exposed down; and with the trees many Fungi have introduced themselves, probably strangers there before. This opens a subject of curious inquiry, for some Fungi appear invariably on the stumps of felled trees, though it must be doubtful in what manner pre-existing sporules migrated there, if they did so at all. In the case of fairy-rings, *circles of agarics* suddenly appear where they had been previously unnoticed; and, as Dr. Badham, in his account of the English esculent Fungi, justly observes, "We know as little of the *origin* of the fairy-rings, as of any other phenomenon connected with the growth of funguses." I was particularly struck with the number of *Agaricus rutilans* (xerampelinus, *Sow.*) on Worlebury Hill, almost every larch-stump presenting a group of this richly-coloured species, whose golden gills so well distinguish it among the intricate tribe of agarics. The scales of the pileus are at first purplish, and the epidermis pale, but in maturity the down becomes crimson and sienna, and the gills of a golden yellow too vivid for the pencil to portray. This agaric must be a new botanical feature here, for, though the plantation seems of about twenty years' growth, the agaric would not appear until its proper nidus presented itself in the *stumps* of the firs or larches. Another beautiful agaric, that was very plentiful on the mossy turf of the hill, but within the limits of the plantation, was *Agaricus deliciosus*, distinguished by its orange gills and red juice. In a young state its pileus is zoned with red in light and deep alternate shades, but changing to duller orange, and when past maturity fading to pale brown, and looking very different to its early state. The gills, too, though at first of a bright orange hue, become greenish, and even prismatic, in decay.

The sweet odours that load the moist autumnal air from various Fungi, is a pleasing feature of the season that often attracts the attention of the botanical wanderer, whose nose is perhaps oftener called into requisition with the "fungous fruits of earth" than even with the loftier flowery tribes. A fungologist should be able to "hark forward" when he comes upon "the scent;" and thus I here discovered, almost hidden from view among the grass and bushes, a most elegant group of the delicate, green-tinted *Agaricus odoratus*. This species long retains its hay-like smell; and several other agarics may be hunted up in the same way. There is something exciting in thus tracking a plant by its trail, and penetrating to its hidden retreat. But I am often "at fault" with the strong-smelling *Phallus*, which throws off its odour most powerfully a little distance from its seat.

On turf within the plantation, in various spots, *Boletus edulis* appeared in such abundance, that any vegetarian having faith in Dr. Badham's Apician account of the delicious relishes to be obtained from our edible Fungi, which he compares to custards, lamb's kidneys, oysters, &c., might here have lived in clover for a month, as I noted the *B. edulis* still coming up plentifully on the 2nd of November.

I observed some large and dense *rings of agarics* on the side of the hill; and one of these, which was very perfect, was composed of the sweet-scented *A. Prunulus*. It was fifteen yards in diameter, and included within its confines a number of larch and fir-trees, apparently of about twelve or fourteen years' growth, if not more, as they grew rather close together. Another wide, extending ring, probably of *A. grammopodius*, enclosed several firs and large hawthorns. Now both these agaric-circles were very entire, broad, and well covered; and if, as generally supposed, these rings commenced originally with a single agaric, and a small circle was "disseminated by spores all round," as intimated by Dr. Badham, it seems difficult to imagine how the increasing ring could have passed the trees without several gaps and eccentricities being made in its shape, which could scarcely have amalgamated again. If, on the other hand, it be thought that the trees were planted within the existing rings, that would assign to them a considerable age, and a very slow rate of increase, if, indeed, any at all.

How long "fairy-rings," which are more or less tenanted with some species of agaric, will last seems not very well determined. They certainly continue a long time.

“ Look for years to come, and still the place is seen,”

says Clare, the rural poet, who doubtless had them often under his view; but they die away at last; and Dr. Badham notices the rings formed by *A. Prunulus* as “breaking up into irregular lines.” Further and closer observations, however, are required on this point, for I have noticed circles of *A. oreades* to be very persistent for years, although there may be a superficial extension of the verdure of the grass in their vicinity.

From an attention to the subject for some time, I am inclined to question very much the theory of the concentric extension of these agaric-rings from pre-existing smaller ones, whether above or below the soil. The imaginary *very small rings*, marking the first supposed impulsive process, I have never been able to meet with; and I believe that the ordinary circles, commonly known as “fairy-rings,” whatever may be the *modus operandi*, appear at once in full dimensions, fresh to the morning light, almost as rapid in their formation as the mushroom itself. This would agree with the popular superstition, which supposes the sudden appearance of worn, “sour ringlets” where none were seen before.

EDWIN LEES.

Henwick, near Worcester,
December 13, 1851.

Boletus parasitic upon a Lycoperdon. By JAMES BLADON, Esq.

IN 1848, whilst botanizing in a wood near this town, I met with a *Boletus* and a puff-ball (*Lycoperdon* — ?) growing close together. On stooping to examine them, to my surprise I found them fast together. The stem of the *Boletus* did not quite reach the earth, but the lower end was turned obliquely, and was rooted to what may be termed the neck of the puff-ball. The conjunction of the two was sufficiently firm to bear carrying home, and afterwards making a section of *in situ*. As I was making a second incision, for the purpose of cutting a slice for a preserved specimen, they then separated. The expanded pileus was about an inch and a half in diameter, and the *Lycoperdon* about the same size. There was a small indenture on the side of the head where the stem of the *Boletus* pressed against it. I found two other pairs of specimens, in the same state, the same morning.

JAMES BLADON.

Pont-y-Pool, December, 1851.

Extracts from the 'Proceedings of the Linnean Society of London.'

(Continued from page 210).

On the Aquilaria Agallocha, Roxb., the *Agallochum* or Aloë-wood Tree of Commerce. By the late William Roxburgh, M.D., F.L.S., &c.; communicated by the President.

THE memoir, written in 1810 or 1811, contains a detailed description of this important tree, as well as much other information in addition to that published in the posthumous 'Flora Indica' of the author. The plants described were sent to the Calcutta Botanic Garden by Robert Keith Dick, Judge and Magistrate at Silhet; and an extract is given from a letter addressed by that gentleman to Dr. Roxburgh, in which he states that the wood is brought for sale from the country of Kuchar and from the southern parts of the zillah of Silhet, particularly the divisions of Puthureea and Lunglah, where the tree is known by the Bengal name of Tuggur. Its extreme height is from sixty to seventy cubits, and the trunk from two to two and a half cubits in diameter. No part of the wood, except that which is used for the extraction of the Uttur, is applied to any useful purpose. Few trees contain any of this precious perfume, and such as do, have it very partially distributed in the trunk and branches. The people employed in its collection, however, cut down all the trees indiscriminately, and then search for the Aggur by chopping through the whole tree, and removing such portions as are found to contain the oil or have the smell of it. In this state Mr. Dick describes four different kinds, of which the first, called Ghurkee, sinks, and sells at from 12 to 16 rupees per seer of 2 lbs.; the second, called Doim, produces from 6 to 8 rupees per seer; the third, Simula, floats, and is sold at from 3 to 4 rupees; and the fourth, Choorum, in small pieces, which also float, at 1 to 1½ rupees per seer. The oil is obtained by bruising the wood in a mortar, and then infusing it in boiling water, when the Uttur collects on the surface. Neither root, leaves, nor bark yield any Uttur. Some trees will produce a maund (80 lbs.) of the four sorts. So far Mr. Dick. Dr. Roxburgh thinks that there is a wonderful agreement between the various but imperfect accounts of the trees said to produce the Calambac or Agallochum of the ancients and that which he describes. He notices the descriptions given by Lamarck and Cavanilles, which he thinks, as far as they go, agree well with the plant of the Botanic Garden; as do those of

Rumphius, making some allowance for the imperfection of his figures. Kæmpfer's figure and description also exactly correspond with young specimens in the Botanic Garden sent from Goalpara by Dr. Buchanan and from Silhet by Mr. Smith; and a description of the fruit by Mr. James Cunningham is quoted as very exact. Dr. Roxburgh gives his reasons for believing that not only the *Ophispermum Sinense* of Loureiro, but also the *Aloëxylum Agallochum* of that author, are both of the same genus, if not the very same species, with the plant from Silhet. There runs indeed so uncommon a coincidence through the whole of these notices as to induce him to believe that they all relate to the same identical object. He concludes by retracting what he had previously said, in his account of *Amyris Agallocha*, as far as relates to its yielding Calambac, which he acknowledges to have been founded on erroneous information.

Dr. Roxburgh's memoir was accompanied by some remarks by the late H. T. Colebrooke, Esq., F.L.S., consisting chiefly of references to and extracts from various Oriental authors, in relation to this fragrant wood, the countries in which it is found, the tree from which it is derived, its various kinds, and the processes used in extracting the oil. On the subject of the etymology of the word *Agallochum*, he observes that it is not right to derive it from the Arabic, which on the contrary is confessedly borrowed from the Greek, that is to say, from the *Agallochon* of Dioscorides. Neither is its origin to be sought in the Hebrew *Ahalim* and *Ahaloth*, as proposed by Salmasius, since it is more obvious to deduce it from the language of the country whence the drug was brought; and the Indian name *Aguru*, or with the Sanscrit pleonastic termination *ca*, *Aguruca*, is much nearer to the sound of the Greek term. The Portuguese *Pao de Aquila*, he adds, is an undoubted corruption of the Arabic *Agháluji* or of the Latin *Agallochum*; and it is by a ludicrous mistake that from this corruption has grown the name of *Lignum Aquilæ*, whence the genus of the plant now receives its botanic appellation.

Notes on Bdellium. By B. A. R. Nicholson, Esq., M.D., of the Bombay army; communicated by the Secretary.

Dr. Nicholson states that the tree which he identifies as producing the *Bdellium* of Greek and Roman authors, occurs in the hilly districts of North-western India, where it is known to the natives by the name of *Googul*. He extracts the account of *Bdellium* from Ainslie's '*Materia*

Indica,' and comments on some of the statements therein contained. Thus, for example, Ainslie says that "all of this gum-resin found in India is brought from Arabia, where the tree is called Dowm;" but Dr. Nicholson states that wherever the tree is found in the North-western provinces, the bazaars are supplied with the gum from it; and that he never heard the tree called Dowm in Arabia, although he has been in many parts of that country, where he has seen the Googul. Dr. Ainslie again quotes Sprengel, who erroneously states that Dowm is the Arabic name for *Borassus flabelliformis*, and cites Kæmpfer and Rumphius in proof that Bdellium is procured from that tree; but Dr. Nicholson believes the Arabic name Doom to be exclusively applied to the dividing-stemmed palm (*Hyphæne Thebaica*, Gærtn.), which is common on the banks of the Nile, in the Thebaid and Upper Egypt, two or three trees of which he has seen growing at Mocha, and a single tree at the west end of the native village opposite to the Portugese settlement in the Island of Diu in Kattiawar. He has frequently examined this palm without detecting any gum; and it is well known in India that the Tari (*Borassus flabelliformis*) does not produce gum. Another palm (*Chamærops humilis*, L.) has been also affirmed to produce Bdellium, and Matthiolus is quoted as having witnessed the fact at Naples; but Dr. Nicholson states that he particularly examined this *Chamærops* at Girgenti in Sicily in all stages of its growth, in flower, in fruit, and without either, and never observed anything like gum.

After refuting these erroneous notions as to the origin of the gum, Dr. Nicholson proceeds to state that he met with the Googul plant for the first time in 1832 on the Hills of Balmeer, in the Chotee Thur or Little Desert, on taking and sacking which town large quantities of the gum were found in several of the Banyan houses. The bush is also plentiful about Joolmaghur, thirteen miles south-west from Balmeer; and the author has observed it on the Kulinjur Hills in Parkur, as well as on those of several parts of Kutch and Wangeer. Having been shipwrecked in 1836 on the southern coast of Arabia, about 200 miles east of Cape Furtash, and being carried by the Arabs to the town of Geda, about three miles distant from the coast, he observed that large quantities of the gum Googul, there called Aflatoun, were brought to Geda by the Bedouins from the interior, where he was informed that the tree producing it was very plentiful, and that the gum is annually carried thence to Mocha on camels, and exported from Mocha to Bombay and other places. He subsequently found the Googul bush on the hills of Yemen, and in 1841 on the hills

above Wankaneer in Kattiawar. The gum is chiefly used as a frankincense; but the natives of Guzerat, and probably of other provinces where the tree is found, collect and bruise the recent berries and twigs, boiling the juice out in cauldrons, and having mixed it with their chunam (lime), to which it imports increased tenacity, commence all their dwellings with lime thus mixed, it is said from a religious motive. The gum is found most abundantly after the rains, when it is collected in pieces as it exudes from the tree, and is often very dirty from the careless way in which it is gathered, being mixed with the bark and twigs, and sometimes even with the subjacent soil. The harder and nearly transparent drops are picked out by the Banyan merchant, and fetch a higher price than the rest.

The author states that he is indebted to the late Dr. Charles Lush, F.L.S., Superintendent of the Honourable East India Company's Botanical Gardens at Darpoorie, who in 1842, from the sketches and specimens then in the author's possession, identified the plant as the *Amyris Kataf* of Forskahl, and assisted in identifying the gum with the *Bdellium* of the ancients. He believes that if at all known to Roxburgh, it must be under the names of *Amyris nana* or of *Boswellia*.

The paper concluded with a description of the plant, and with some remarks on the geological character of the localities in which it is found; and was accompanied by a sketch of a branch, and by specimens of the gum in its pure and mixed states.

On a large Block of Sandstone from the Neighbourhood of Swellendam, South Africa. By Benjamin Kennedy, F.L.S.

Mr. Kennedy, in exhibiting the sandstone, which was sent to him by his son, gave the following extract from the letter accompanying it:—

“The fossil (if fossil it is) which I have sent you is about one-sixth part of one I saw in Kerqua's Kloof, eighteen miles west of this place (Swellendam). It covered the face of a rock which projected from the side of a mountain at its base. Four branches radiated from a centre. I was in hopes that I should have been able to have got off the whole piece, but unfortunately it split into three pieces when I applied the wedges, having previously drilled holes, which took four men a whole day to do. This stone has been known to the people here for the last twenty-six years. The plane of the fossil was per-

pendicular, and another piece had split off from the rock, and which piece I found lying at the foot of the other, and also having an indented impression, but not so distinct, at least only in parts. I have been unable to meet with any geologist here who can explain it, or give any history of the formation in which it is found. Some have pretended to know something about it, but their opinions differ considerably. Some say the plant has grown there since the rock was found; others that it is a zoophyte, and not a plant at all; while one man, a German, says that it was imprinted in the rock whilst soft, and has been subsequently hardened by great heat, as the crystals show. I think he is nearer the mark. The place in which it was found is most wild-looking. It is a mountain pass; so you would call it in England; we call it a Kloof. This pass runs through a low range of mountains, the end as it were of the great range which begins near Cape Town, but separated from that by the river Zondereuch. Curiously enough, although it appears to be a continuation of the great range, its structure is totally different in appearance. The whole mountain seems to have been broken up into huge blocks of rock, but yet preserving a stratified appearance, more regular in some parts than in others. In some places, too, the strata are horizontal, in others inclined at an angle of 20 degrees. All the rocks are more or less crystallized, and *nearly all* have the traces of vegetable remains (sea-weeds, as I think) upon them. I walked over the mountain, or rather climbed amongst the rocks, crowbar in hand, and found many similarly marked; not, I mean, with the same plant, but in the same sort of way as the one sent. Mr. Vigne showed me a stone that he had found on the mountain behind his house; there was an appearance of a fossil plant, very much resembling the one I send you; but the plant itself was there changed into stone or coal quite black; but instead of being an impression, it might be called a basso relievo. The stone was quite different, being a dark-coloured sandstone, and not at all crystallized."

It appeared to be the prevalent opinion of the members present that this remarkable impression was the result of dendritic crystallization.

Notes on the Leaf of Guarea grandifolia, DeC. By R. C. Alexander, Esq., M.D., F.L.S.

In the specimens of a *Guarea* from Jamaica, the *G. grandifolia*, DeC., presented to the Society, it will be seen that the lower leaflets

have fallen off, while younger ones are being developed at the extremity of the same petiole. At the time of flowering, the number of leaflets varies from a single pair to eight or ten pairs; but as these fall off in the course of a few months, the petiole elongates, and at each successive rainy season, of which there are two in the year, throws out from the end a fresh foliage of several pairs. The lower and older part of the petiole in the meantime remaining attached to the stem, becomes completely ligneous and round, and acquires a rind distinct from the wood, and covered with lenticelles and a resemblance to pith in the centre;—takes on, in short, the character of a branch, from which it is only to be distinguished by the axillary inflorescence, the absence of buds in the axillæ of the leaflets, and the analogy with the closely-allied genus *Trichilia*, in which the same phenomenon is seen in leaves deciduous after the second development. In *Guarea*, at least in this species of it, the leaf seems to be continuous with the branch, without articulation, and to have no definite term of life, hanging on till overtopped and killed by other leaves. Its usual length at that period is from a yard to four and a half feet.

In Adrien de Jussieu's Memoir on the *Meliaceæ* are the following remarks:—

“The resemblance of the leaflets borne on the same petiole to leaves borne on the same branch becomes more striking still in certain genera, as *Guarea*, where the extremity of the petiole, after a series of leaflets perfectly developed, presents some which are not yet so, and which appear to belong to another shoot. It would be interesting to ascertain what becomes of them, a thing that I have not been able to do, having had none but dried specimens to examine.”

This shrub usually grows at the base of large timber trees, such as the *Eriodendron anfractuosum*, in the pasture districts of St. Ann's parish, establishing itself between their elevated buttress-like roots, and, with its leaves hanging down to the grass, forms natural arbours, or rather stables, in which the cattle repose during the heat of the day. The negroes use them to wattle the walls of their huts, and call the bush “alligator tree,” probably from the two Spanish words “*a ligar*,” to tie with. Where it stands free, it attains the size of a full-grown apple-tree; but it invariably, I believe, grows within shelter of some other and larger one.

Except this genus and *Trichilia*, I found no other in Jamaica that had the character of leaf above described.

PROCEEDINGS OF SOCIETIES.

Botanical Society of London.

Friday, January 2, 1852.—J. E. Gray, Esq., F.R.S., President, in the chair.

The following donations were announced:—British plants from Mrs. Atkins, Miss Barnard, Mrs. Russell, Mr. H. D. Geldart, Mr. E. G. Varenne, Mr. F. Barnard, Mr. T. Moore, Mr. W. H. Purchas, Mr. F. H. Goulding, Rev. T. G. Carter, Mr. Fenton J. A. Hort, Mr. T. Clark, Mr. F. P. Pascoe, Mr. R. Hudson, Mr. Willmott, Mr. S. O. Gray, Mr. W. Godley, Rev. W. A. Leighton, Mr. T. Sansom, Mr. B. D. Wardell, Mr. W. Bean, Mr. F. Brent, Mr. J. A. Brewer, Rev. R. C. Douglas, and Mr. F. Barham.

The President nominated John Miers, Esq., F.R.S., and Arthur Henfrey, Esq., F.L.S., Vice-Presidents.

The following paper was read:—

‘A few Remarks on three Species of *Hieracium* not mentioned in the last edition of the London Catalogue of British Plants, published under the direction of the Botanical Society of London;’ by John G. Baker, Esq., Corresponding Member of the Society. “I am sending for the herbarium of the Society specimens of *Hieracium plumbeum*, *cæsium*, and *corymbosum*, *Fries*, which were collected, by myself, in Upper Teesdale, during the present autumn, and am desired to accompany them with a few remarks on their characters and affinities.

“In the ‘*Systema ad Historiam Hieraciorum*’ of *Fries*, which has added so much to our knowledge of this puzzling genus, *H. plumbeum*, *Fr.*, is No. 79, being the only species between *murorum*, *L.* (No. 78), and *cæsium*, *Fr.* (No. 80). It is mentioned in that work as occurring in Britain, but no locality is given; and it is not included in the third edition of *Babington’s Manual*; so that I presume that, at the time of publication, that author had not seen a British specimen. The following short account of its characters is drawn up from my Teesdale specimens:—

“*Hieracium plumbeum*, *Fr.* Herb green; root woody; stem scape-like, leafless, or with one linear, stalked leaf, rather lower than the middle, glabrous below; root-leaves numerous (four to ten), ovate-lanceolate, entire, or serrato-dentate, with triangular teeth below, green and glabrous above, glaucous beneath, with long, white, silky hairs on

the midrib and margin; panicle branched, with three to eight corymbose heads; pedicels arcuate, ascending, and with the broad-based involucre covered with black hairs and setæ, but without white, stellate down; phyllaries cuspidate, irregularly imbricated, black in the centre, with decided, light-green margins; heads cylindrical; flowers bright yellow; fruit cylindrical, deeply striated, narrowed below; pappus dirty white; hairs unequal. Distinguished from *H. murorum* by the absence of white, *stellate pubescence*, and the presence of numerous black hairs on the involucre and pedicels, by the woody root, smaller and more numerous heads of flowers, broad-based involucre, and the smaller and more serrated leaves; from *H. cæsius*, *Fr.*, by its scape-like and frequently leafless stem, by the absence of white, stellate pubescence, and the presence of numerous setæ on the involucre and phyllaries, and by its cuspidate phyllaries, with decided, green margins. My specimens were gathered on the rocks at Falcon Clints, the rocky bank of Widdy-bank Fell, fronting the Tees, on the Durham side, where Yorkshire, Durham, and Westmoreland meet. I have not seen or heard of it from any other locality in Britain, though it possibly may be found not uncommonly when better known. Its near ally, *H. cæsius* *Fr.*, is well known to British botanists as *H. murorum*, under which name, along with the true plant of Linneus, it is described by nearly all our authors, and is figured in 'English Botany,' 2082.

"*Hieracium cæsius*, *Fr.* Herb cæσιο-glaucous; rootstock woody; stem leafy, slightly hairy; stem-leaves one to four, the lowest stalked, ovate, toothed, the upper lanceolate, entire; root-leaves many, cordate-ovate, lanceolate, green and slightly hairy above, green or glaucous, with more numerous hairs below; panicle branched, corymbose; heads numerous; pedicels elongated and, along with the involucre, covered with thick, white, stellate down, numerous black hairs, and fewer setæ; phyllaries irregularly imbricated, narrowing gradually, bluntish, uniform, black or lighter towards the margin; heads small, cylindrical; flowers deep yellow; fruit cylindrical, slightly broader near the base, narrowing above and below; pappus dusky white; hairs unequal. Distinguished from *H. murorum* by its cæsius involucre and pedicels, with numerous black hairs, by its thick, woody root, and more numerous stem-leaves, which therefore cause the stem not to bear any resemblance to a scape, as in that species, and by its smaller heads, and blunt, not cuspidate, phyllaries, which do not exceed the opening flowers; from the very variable *H. sylvaticum* by its more cæsius involucre and pedicels, with numerous hairs and

setæ, by the greater number of its root-leaves, and less leafy stem, and by the corymbose and smaller heads, and bluntish phyllaries. This species is common on walls and rocks, and varies considerably, but is probably truly distinct.

“The third species, *H. corymbosum*, *Fr.*, is the tallest and most conspicuous of our British species, being from three to four feet high, and occasionally having from thirty to forty heads of flowers in one panicle. It is one of the commoner Teesdale species, growing, in company with *H. crocatum*, *Fr.*, on the heathy banks of the river from Langdon Bridge to Newbiggin, and is found in similar situations in both Wales and Scotland.

“*Hieracium corymbosum*, *Fr.* Stem not producing a radical rosette, very leafy, panicled or corymbose above; leaves sessile, ovate-lanceolate, acute, with numerous unequal teeth; upper leaves with a broad base strongly clasping, lower narrowed below, and slightly clasping; panicle, or corymb, very much branched, heads numerous, six to forty; pedicels scaly, glabrous or stellate, downy; involucre slightly narrowed below, glabrous, or slightly hairy and setose; phyllaries pale-edged, in regular rows, inner broad, obtuse, outer smaller, narrow, acute, passing gradually into the scales of the pedicels; flowers deep yellow; seeds chestnut-coloured, angular; pappus dirty white. Distinguished from *H. crocatum* and *boreale*, *Fr.*, by its broader, more numerous, and more serrated leaves, which clasp the stem, by its large, branched panicle, with numerous heads, by its slightly narrowed involucre, and margined and hairy or setose phyllaries. This species does not appear to be mentioned in Fries’s Monograph as British, but is included in the last edition of the Manual, and is, it seems, by no means very rare. Most likely a good many specimens exist in herbaria under other names.”—*G. E. D.*

Botanical Society of Edinburgh.

Thursday, January 8, 1852.—Dr. Seller, President, in the chair.

The following donations were announced to the herbarium:—From Professor Balfour, a large collection of valuable Prussian plants; from Mr. Blackie, a collection of plants illustrating his paper on the Flora of Bonn, on the Rhine; English plants from Mr. G. Lawson.

Dr. Balfour exhibited specimens of *Batrachospermum alpestre*, and of *Lemania fluviatilis*, with *Trentepohlia pulchella* on it, collected at Coniston, by Miss S. Beever.

Dr. Balfour also exhibited the following specimens, presented to the museum at the Botanic Garden :—Cones of *Pinus Pinea*, stone pine, from Italy, presented by Mr. William Gourlie, jun., Glasgow; dried specimen of a turnip affected with the disease called anbury, or finger-and-toes, from Lanarkshire, presented by Dr. Douglas Mac-lagan.

There were likewise exhibited specimens of *Arenaria ciliata*, from Ben Bulbin, Co. Sligo, at a height of 1000 feet, and of *Rosa hibernica*, from Holywood Road, near Belfast, both collected by Dr. Dickie, and presented to the Society's herbarium by Professor Balfour.

Dr. Balfour stated that, by mistake, in printing the notice of Dr. M'Cosh's paper 'On the *Fuchsia*, considered Morphologically,' read at a previous meeting, the angle of the veins of the leaf is stated at 50 in place of 60 deg. Dr. M'Cosh says that the angle is the same for all *fuchsias* he examined; for leaf and branch, 60 deg.

Dr. Balfour read a letter he had received from Dr. R. C. Alexander, in which he remarks :—"Should any collector be undecided where to fix himself, I would recommend the West Indies. Although longer known to us than any other tropical country, it is still very imperfectly explored; and every island yields different results. The Blue Mountain peak is almost unexplored. I ascended it once only, not being aware how many of the species were new till my return; the usual case, for even if you have the books you have no time to use them. The Cuban species, as far as can be deduced from De Sagia's *Flora*, seem to be very different, and almost equally to those of St. Domingo, of which there is a large collection at Philadelphia, made by a French botanist (Poiteau, I think), before the Revolution. If it were but possible to use the same exercise there as in cold countries, what a field those islands would be!"

Mr. M'Nab mentioned that on the 7th instant the following plants were in flower, in the open air, in the Royal Botanic Garden :—*Tritonia media*, *Helleborus niger*, *Phlox verna*, *Primula veris*, *Hepatica triloba*, *Doronicum caucasicum*, *Pyrus japonica*, and *Tussilago fragrans*.

In allusion to Mr. M'Nab's notice, Dr. Greville stated that he had, a few days ago, received sweet violets from the neighbourhood of Darlington.

The following papers were read :—

1. 'Descriptions of *Rubi*;' by Charles C. Babington, M.A. The author states ;—"In the third edition of the '*Manual of British Botany*,' I have endeavoured to arrange and characterize the *Rubi* in a

better manner than was done in my former publications upon that perplexing genus; and as there are a few species which have not been brought under the notice of botanists in detailed descriptions, it seems desirable that it should now be done." The following are the species described in the paper:—

(1). *Rubus Leesii*, Bab., formerly described as a variety of *R. Idæus*. The strong canes of this *Rubus* in the Cambridge Botanic Garden nearly all produced a small panicle of flowers at their extremity, in October, 1851. In one single instance a cane of *R. Idæus* did the same. Previous to that month neither Mr. Stratton, the Curator, nor Mr. Babington had noticed such an occurrence in the latter, and had not had the opportunity of doing so in the former. This is a curious illustration of the tendency of all Rubi to attempt to increase by some action at the end of the shoot of the year. In all the arching and prostrate species it is effected by the end of the shoot penetrating the surface of the ground and taking root. In those plants, the end of whose shoots never reaches the ground, the same is attempted to be effected by flowers. The mode in which the procumbent plants succeed in penetrating the earth seems to be worthy of notice in this place, for the prostrate portion of their shoots appeared to present a difficulty. The fact is, that, although the shoot is really prostrate until the autumn, at that time its extremity forms a small arch, and thus presents its point perpendicularly to the ground, which it easily penetrates.

(2). *Rubus fissus*, Lindl. A full description of this plant is given in Leighton's 'Flora of Shropshire,' and in the 'Phytologist.'

(3). *Rubus latifolius*, Bab. This species has been found in the wood above Cramond Bridge, on the Linlithgow side of the river, and also in a wood just below the road, from Kenmore to Acharne, in Perthshire. It is a large, straggling plant, with strong but usually prostrate stems. The thin, singularly broad, and angular leaves, and the deeply furrowed stem, would perhaps be in themselves sufficient to distinguish it from the other Rubi in the section Nitidi.

(4). *Rubus imbricatus*, Hort. A full description of this species has been given by Mr. Hort, in the 'Annals of Natural History.'

(5). *Rubus mucronatus*, Blox. This species has been found in Leicestershire, Warwickshire, Shropshire, and also in the Island of Islay, and near Loch Eil, in Scotland. In the shape of its leaves, and its very loose panicle, with singularly long-stalked flowers, the plant closely resembles *R. Lingua*, as represented in the 'Rubi Germanici;' but the armature of its stems is very different.

(6). *Rubus clavatus*, Blox. Found in various parts of Leicestershire and Shropshire. This species was long considered by Mr. Bloxam as the true *Rubus sylvaticus* of Weihe and Nees; but, as the plant of these authors seems probably to be a state of *R. villicaulis*, Mr. Bloxam has given a new name to this, derived from its barren stem becoming, as it were, bald at an early period. It does not much resemble *R. villicaulis*, either in appearance or characters; and its true position in the genus is probably still to be decided.

Mr. Evans and Mr. M'Nab remarked that it was by no means uncommon for the raspberry to produce flowers and fruit in autumn. Every gardener knew that there were autumn-bearing varieties of the plant.

2. 'On the Growth of various kinds of Mould in Syrup;' by Professor Balfour. Dr. Balfour remarked that much interest had been recently excited by the statements relative to the vinegar-plant, as it had been called. This plant, which has a tough, gelatinous consistence, when put into a mixture of treacle, sugar, and water, gives rise to a sort of fermentation, by which vinegar is produced. After six or eight weeks the original plant can be divided into two layers, each of which acts as an independent plant, and when placed in syrup continues to produce vinegar, and to divide at certain periods of growth. The vinegar thus produced is always more or less of a syrupy nature; and when evaporated to dryness a large quantity of saccharine matter is left, as was shown in a specimen produced. Various conjectures have been hazarded as to the origin of the so-called vinegar-plant, some stating that it came from South America or other distant regions, and others that it is a spontaneous production. Lindley states that it is a peculiar form of *Penicillium glaucum*, or common blue mould. There seems to be no doubt that it is an anomalous state of mould, or of some Fungus allied to it; and the peculiarity of form and consistence appears to be owing to the material in which it grows. In place of producing the usual cellular, sporiferous stalks, the mycelium increases to an extraordinary extent, its cellular threads interlacing together in a remarkable manner, and producing one expanded, cellular mass, with occasionally rounded bodies, like spores, in its substance. The cellular filaments are seen under the microscope. The tendency to divide in a merismatic manner is common in many of the lower classes of plants; and this seems to be what occurs at a certain period of growth, when the plant divides into two laminæ, in a horizontal manner. If the plant is allowed to continue growing it forms numerous laminæ, one above the other, somewhat like the mode in

which some monocotyledonous stems, or corms, increase. The anomalous forms of Fungi, in certain circumstances, has lately excited much interest; and Mr. Berkeley has called attention to some of the remarkable transformations which they undergo. These transformations are such, that many forms considered as separate genera are now looked upon as mere varieties of one species. That mould of various kinds, when placed in syrup, shows the same tendency to form a flat, gelatinous, or somewhat leathery expansion, is shown by the following experiments:—Some mould that had grown on an apple was put into syrup on the 5th of March, 1851; and in the course of two months there was a cellular, flat, expanded mass formed, while the syrup was converted into vinegar. Some of the original mould was seen on the surface in its usual form. Some mould from a pear was treated in a similar way at the same time; and the results were similar. So, also, with various moulds growing on bread, tea, and other vegetable substances. The effect of these moulds was, in most cases, to cause a fermentation, which resulted in the production of vinegar. In another experiment, on the 8th of November, 1850, a quantity of raw sugar, treacle, and water were put into a jar, without any plant being introduced; and they were left untouched till March 5, 1851. When examined, a growth like that of the vinegar-plant was visible; and vinegar was formed. The plant was removed, and put into fresh syrup; and again the production of vinegar took place. It would appear, from experiment, that, when purified white sugar alone is used to form syrup, the plant, when placed in it, does not produce vinegar so readily, the length of time required for the changes varying from four to six months. There may possibly be something in the raw sugar and treacle which tends to promote the acetous change. Specimens of the different kinds of moulds were shown, some in syrup of different kinds, and others in the vinegar which had been formed.

Dr. Greville remarked that he had no doubt that the vinegar-plant was an abnormal state of some Fungus. It was well known that many Fungi, in peculiar circumstances, presented most remarkable forms. He instanced the so-called genus *Myconema* of Fries, as well as the genus *Ozonium*. Even some of the agarics present anomalous appearances, such as the absence of the pileus, &c., in certain instances. The remarkable appearances of dry rot in different circumstances are well known. Although syrup, when left to itself, will undergo the acetous change, still Dr. Greville was satisfied that the presence of this plant promoted and expedited the change.

Professor Simpson remarked that the changes in Fungi may resemble the alternation of generations, so evident in the animal kingdom, as noticed by Steenstrup and others. In the Medusæ there are remarkable changes of form ; and there is also the separation of buds, resembling the splitting of the vinegar-plant.

Mr. Embleton remarked that in the neighbourhood of Embleton, in Northumberland, every cottager used the plant for the purpose of making vinegar.

3. Professor Simpson communicated the results of some experiments, made by himself and Mr. John Stewart, relative to the growth of alpine plants, after having been kept artificially covered with snow in an ice-house for many months. Seeds and plants, when kept in this way during winter, and then brought into the warm air of summer, germinate and grow with great rapidity. Mr. Stewart had also made experiments with animals ; and he found that the chrysalis so treated produced a moth in eleven days after being brought into the atmosphere, while other chrysalides of the same moth did not do so for three to four months afterwards. In arctic regions the rapid growth of plants during the short summer was well known. Professor Simpson alluded to the importance of similar experiments being made on the different kinds of grain. He referred to the rapidity of harvest in Canada and other countries, where the cold lasted for many months ; and he was disposed to think that if grain was kept in ice-houses during winter, and sown in spring, there might be an acceleration of the harvest. He considered the subject deserving of the attention of agriculturists, for a saving of a few weeks in the ripening of the crops would be of vast consequence in Britain. Moreover, there might be less necessity for exposing the crops to the variable springs of this country, for the sowing might be retarded. Professor Simpson is still carrying on his experiments. He hoped to communicate further results at a future meeting.

The subject gave rise to some discussion, in which Mr. Embleton, Dr. Greville, Mr. Ivory, and Mr. Evans took part.

4. ' Notice of Plants found near London ;' by Mr. G. Lawson. Having, in September last, spent a day in botanizing the neighbourhood of Wandsworth, Wimbledon, Putney, and Battersea (in Surrey), Mr. Lawson found a few plants which, although probably introduced, were worthy of notice, as not having been previously recorded in the localities. He exhibited specimens of the following :—

Anacharis Alsinastrum, Bab. Found in ditches at Wandsworth Common, where it was intermixed with *Potamogeton densus*.

Trifolium ochroleucum, L. Wandsworth Common. This species is admitted by Mr. Watson as a native in the Thames province ('Cybele,' i. 263).

Trifolium resupinatum, L. Wandsworth Common; of course introduced.

Scorpiurus subvillosus, L. In a cultivated field near to the Wandsworth Railway Station. A southern European species.

Melilotus parviflora, Desf. Wandsworth Common; also in a cultivated field to the eastward of the Wandsworth Railway Station. *Melilotus* supplies a striking example of a genus, embracing three well-known species, besides the present one, becoming thoroughly naturalized in this country. *M. parviflora*, Desf., is very distinct from any other species found in Britain. Racemes *dense*, in fruit elongated and lax; pods subglobose, very obtuse, distinctly reticulate-rugose, glabrous, containing each *one* large, globular seed; leaflets somewhat retuse, serrate, obovate or oblong-cuneate; flowers small, not twice the length of the calyx, deep yellow. Although a tropical weed, this species appears to be widely diffused over the globe, although in some regions probably as a naturalized plant only. Its extensive geographical range is shown by the following notices of specimens, which were exhibited from the herbarium in the University of Edinburgh. In Rugel's collection of Florida plants there are specimens of *M. parviflora*, No. 171, labelled, "Locis arenosis soli expositis et ad litora maris, prope St. Augustine, Florida or., Apr.—Mai. 1848." In the European collection, a specimen, from Professor Edward Forbes, appears to belong to this species. In the Indian collection there are several specimens, showing its prevalence in India, where it appears in the dry season, one of them from Dr. Roxburgh, labelled, in his own handwriting, "Trifol. *M. indica* var.?" Another is from Dr. Jameson, Saharunpore; and in the admirable collection of the Countess of Dalhousie there is a beautiful and characteristic specimen. Dr. Pappe notices this as one of the foreign medicinal plants which have the confidence of the inhabitants of South Africa; so that the species would appear to be found there in a *naturalized* condition. It has no claim to be considered *native* in England. Mr. Babington states that even in the South of France it is only found in lucerne-fields. Mr. Lawson likewise exhibited specimens from the Society's herbarium of the other species of *Melilotus* found in Britain, for the purpose of drawing attention to the characters whereby they are distinguished. The researches of Professor Henslow have led him to the conclusion that the seeds of Leguminosæ retain vitality longer

than those of any other plants; and this seems to be illustrated by the very frequent appearance of foreign Leguminosæ in Britain.

5. 'Notice of the Abnormal Structure of a Turnip;' by Mr. James B. Davies. The author of this paper, after defining the nature of the root of the turnip, giving some observations on tap-roots in general, and showing their relation to those of a fibrous nature, proceeded to remark that all roots are subject to variation, as well from non-development as from increased growth. He exhibited a monstrous turnip, having the appearance of two bulbs, joined in the form of an hour-glass. This he conceived to have been caused by some injury to the root, arresting the expansion of the superior, or first-formed, bulb. He likewise exhibited another specimen, presenting two bulbs, united at the neck, the union extending to a third of their circumference. Mr. Davies did not believe that such monstrosities as this resulted from the chemical condition of the soil, or from the opposition of any external body in the soil, but that one instead of two tap-roots were originally produced, of equal dimensions. This conclusion he had arrived at from an examination of their internal structure, having traced a mass of the small cells resembling those found towards the exterior of the bulb, rising to a considerable height through the root, thus forming an apparent wall between the two bulbs. He had likewise found, in tracing the course of the fibres, that two great masses arose from the crown, and proceeded, in separate courses, one to each bulb. As a remedy for the disease Mr. Davies recommended the raising of seed from transplanted bulbs. He illustrated his remarks by drawings, showing the structure of the turnips alluded to, and the structure usually seen in the turnip bulb.

Dr. Balfour read a letter from Dr. Earnest Meyer, of Königsberg, intimating the transmission of a collection of interesting plants from M. Patze, who has paid particular attention to the species of willow. "As regards the willows," Dr. Meyer remarks, "which constitute M. Patze's delight, I can assure you that each specimen in leaf is taken from the same plant as those which are in flower, whether male or female. As to the hybrid forms of the genus *Salix*, which have caused such a confusion in our systems, there is not one of them which has not been observed by M. Patze for several years, and found, almost always, sterile and in small quantity, among the two common species, which he suspects to be the parents." Dr. Balfour then exhibited the following, most of which he had presented specimens of to the Society's herbarium:—*Salix acuminata* (*S. acuminata-viminalis*), *cinerea-purpurea*, *cinerea-viminalis*, *purpurea*, *silesiaca* (various forms), *pur-*

purea-cinerea, purpurea-incana, purpurea-repens (Doniana), purpurea-silesiaca, aurita-rosmarinifolia, aurita-silesiaca, aurita-repens, stylaris (varieties with smooth and silky ovaries), Starkiana, Starkiana-aurita and var. *sublivida*; *Betula humilis*; *Hieracium vulgatum*, *Fries*, floribundum (*Auricula-pratense*), *Bauhini*, *Pilosella-pratense*, and *pratense*.

The following gentlemen were elected Ordinary Fellows:—John Henry Aldridge, Esq., James Young, Esq., and William Gilby, Esq.

Microscopical Society of London.

November 26, 1851.—Dr. A. Farre, President, in the chair.

Dr. Carpenter detailed the results of some observations made by Mr. Williamson, of Manchester, on the *Volvox globator*. He stated that, startling as the assertion might at first sight appear, Mr. Williamson had come to the conclusion that the *Volvox* belongs not to the animal, but to the vegetable, kingdom, and that he himself, having gone over the evidence, was inclined to concur in this view. The increase of the cells (from the supposed ova) being carried on in a manner precisely analogous to that of undeniable *Algæ*, while many of the so-called polygastric animalcules of Ehrenberg having been proved zoospores of some of the *Confervæ*, renders the supposition probable. It appears from Mr. Williamson's observations, that between the outer integument and the primordial cell-wall of each cell a hyaline substance is secreted, causing the outer integument to expand; and as the primordial cell-wall is attached to it at various points, it causes the internal colouring matter, or endochrome, to assume a stellate form, the points of one cell being in contact with those of the neighbouring cell; these points forming at a future period the lines of communication between the green spots so often noticed on the adult *Volvox*.

Dr. Carpenter argued that the evident automatic action of the vibratile cilia was also in favour of the vegetable theory; and cited a case in which a cistern that had been recently cleared out, and partially filled by the *rain only*, had become suddenly and rapidly covered with a bright-green scum, which on examination proved to be the *Cryptomonas* of Ehrenberg. The water could have contained nothing in solution, with the exception of probably a little carbon; and Dr. Carpenter thought that the distinction between the animal and vege-

table kingdoms could be better defined by having regard to the *nutrition* than by any other mode, animals requiring *organized* matter for food, while vegetables flourish on inorganic matter, or else organic matter in a *state of decomposition*.

Mr. Bowerbank rose, not to oppose Dr. Carpenter's view, but to ask some questions, in order to elicit further information. Was it an established fact that there were cilia, or was their presence merely inferred from the motion? Was there any discharge of the contents of the primordial cell, and, if so, was the contraction sudden or gradual? He had witnessed a similar appearance in the early cells of some of the ferns, in which it was assumed, in consequence of the sudden ejection of the contents; and he appealed to Mr. Deane, who had paid much attention to the development of the ferns in the earliest stages.

Mr. Deane stated that he conceived Mr. Bowerbank had misapprehended Dr. Carpenter's statement, as the stellate appearance in the cells of the *Volvox* was owing to the *dilatation* of the outer integument, in consequence of the formation of hyaline substance, while the appearance in the ferns was owing to the *contraction* of the inner membrane. There was no doubt of the existence of cilia in the mature *Volvox*.

Mr. Shadbolt could speak distinctly as to the presence of cilia in the *Volvox*. Although difficult to see while the creature was in motion, they could be readily observed by confining it, and still more so by compressing and rupturing the sphere, by which means, at the torn edges, they could even be counted. He was not yet prepared to coincide with the vegetable view, and reminded Dr. Carpenter that the automatic nature of the movements could not be considered as any argument in favour of a vegetable theory, as it was precisely analogous to the automatic retraction of the tentacula in the Bryozoa. His chief objection, however, was that the *Volvox* presented a most anomalous appearance when viewed as a *perfect plant*; while the idea of its being a sporangium could scarcely be maintained when precisely similar individuals were formed by a species of reproduction. He believed no instance was known of a seed producing a seed.

Dr. Carpenter replied that certainly in the mosses an increase in the seeds was produced by gemmation; and this might be looked on as a somewhat similar case.

Nees von Esenbeck.

WE are glad to find that we are not singular in sympathizing with the unfortunate Nees von Esenbeck, a man whose only fault it is to hold opinions contrary to those of the party which has acquired the ascendancy in Germany. Our able contemporary, Hooker's 'Journal of Botany,' in announcing to its readers that M. Nees von Esenbeck had been requested to continue as President of the L. C. Academy of Naturalists, and that he had assented, continues:—"This mark of respect towards one of the most classical and distinguished botanists of the age, who during a long series of years has contributed vastly to the celebrity of the Academy, will be hailed, not only by its own members, but by every lover of Natural Science." Such generous expressions are highly creditable, both to the journal in which they appear and the writer from whose pen they issued, and cannot but comfort the illustrious philosopher to whom they refer.

Most of our readers are aware that M. Nees von Esenbeck is the victim of the political re-action on the Continent, but few know the cold-blooded manner in which he has been persecuted. M. N. von Esenbeck has always been the friend of freedom,—for who can be a thinking man without being so?—and has so much enjoyed the confidence of his countrymen, that, a few years ago, he was elected Member of Parliament. His eloquence, his sound reasoning, and the warmth with which he spoke, soon gave him influence in the Assembly, so much so that he became the leader of the popular party. He always remained faithful to his colours; and when so many deserted the cause which they had advocated, when oaths were violated as soon as uttered, and treaties broken before the ink was dry, M. N. von Esenbeck was true to his principles; and neither bribery nor threats produced any effect upon him. Venerable from his age, distinguished as a philosopher, and eloquent as an orator, it was evident that the influence of such a man was to be feared. Moreover, he was no hero of the barricades; he had been legally elected, and conducted his discussions with prudence and propriety, and strictly within the bounds of parliamentary license. But, as silence was thought indispensable, M. Nees von Esenbeck was suddenly suspended in his functions as Professor in the University of Breslau, and reduced to circumstances of the most distressing nature. An excuse for this arbitrary act, however, was thought necessary; and, as despotism is never in want of arguments, however sophistical, to give a colouring to its proceedings, a domestic misfortune rather than a fault of M. N. von Esenbeck's

former life was taken for that purpose; and, at an advanced age of nearly eighty, the venerable old man was punished for an act that happened twenty years before, and which, according to the laws of the country, must have been very slight indeed to remain so long without being investigated.

That public opinion has not been misguided in this matter is evident. M. N. von Esenbeck has not only been re-elected President of one of the most ancient academies in the world, but men are everywhere stepping forward, who endeavour to place him above the want to which the sudden loss of his situation has exposed him. Naturalists of eminence are, we understand, selling portions of their collections, in order to give the proceeds to the illustrious *savan*. We ourselves have been requested by several of our correspondents to open a subscription for his benefit; and we are only too glad to become the humble medium by which that great and good man may be benefited. Having obtained permission from M. Nees von Esenbeck himself, we are ready to receive any sums, however trifling, to acknowledge them in our journal, and afterwards in periodicals of a wider circulation.

It would be trifling with the cause we are pleading were we to attempt to write a panegyric upon a man so unfortunate. A person who is eighty years of age, and in want, not only of the mere comforts of life, but the bare means of subsistence, and who has devoted his whole life and all he possessed to the advancement of science, is indeed worthy of consideration. Entomology, ornithology, botany, and many other branches of learning are indebted to him for some of the most important additions. He has always been ready to assist others whenever he was called upon; and there are many naturalists in Great Britain who have enriched their volumes with his labours. As a teacher, he has done an immense deal. His lecture-rooms were always the most crowded; and subjects which, in the hands of others, appeared dry, insipid, and dull, his eloquence knew how to make interesting and charming. There are few who have ever seen him on the platform who can forget the impression which his lectures produced; the sparkling eye, the animation, and clearness of explanation never failed to produce most favourable effects. His labours as an author are numerous, and show great erudition and research. They belong to that class of writing which freed Natural History from the pedantic sway of the Linnean school, and fairly applied the light of philosophy to the investigation of organized beings. Indeed, M. N. von Esenbeck is one of the remaining few who conclude the circle of illus-

trious men who raised natural science to the rank it now holds, and in which the names of Jussieu, DeCandolle, Goethe, and Link, not to mention any living ones, stand pre-eminent.

We have also been requested to prepare an address, and now have the pleasure of submitting the following one to the consideration of our readers. Whoever would wish to sign it, is invited to send his name to our office (9, Devonshire Street, Bishopsgate, London). Previously to the delivery of the document we will cause the names, arranged alphabetically, to be printed in some of the journals of the widest circulation, both at home and abroad.

TO M. NEES VON ESENBECK, PRESIDENT OF THE L. C. ACADEMY OF
NATURALISTS.

MR. PRESIDENT,

The undersigned have learned, with feelings of the deepest regret and sorrow, that you have been suspended in your functions as Professor in the University of Breslau; that a man whom they have always regarded as one of the most classical, has suddenly been arrested in the pursuit of those investigations which have been productive of such invaluable results to science. It falls but to the lot of a few to make, at an advanced age, those treasures available which a life of constant application and incessant study have enabled them to accumulate. You, Mr. President, are, by the grace of Providence, still in possession of those faculties which allow you to add to the brilliant achievements and important labours of which your whole career has been an uninterrupted series. How painful, then, becomes the reflection, that what God has granted man has cruelly prohibited, and, by depriving you of those means essential to existence, is about to bury for ever your vast amount of knowledge, and consign you, as it were, alive, to a premature grave. Keenly as we feel your misfortune, still more keenly do we feel our inability to alleviate it. Our voice of sympathy is the only consolation we can offer; and we declare that, uninfluenced by the slanders with which malignity has overwhelmed you, we still remember your name with gratitude and respect; and, deaf to the arguments with which envy and hatred have attacked you, we still look upon you as the great philosopher who has raised for himself in the field of science a monument, which neither the violence of parties nor the lapse of time are capable of overturning.

Notes on some of the British Plants for Distribution to the Members of the Botanical Society of London in 1852. By JOHN T. SYME, Esq.*

THE readers of the 'Phytologist' will remember with pleasure Mr. H. C. Watson's valuable annual notes on the novelties and critical species of plants sent to the Botanical Society of London. These notes contained so many useful remarks on the distinctions of doubtful species, that they possessed quite as much interest for botanists in general, as for the members of the Society who were to receive the specimens commented upon. I regret that this year the task has fallen into hands so incompetent as mine; but as there are many plants which require more information to be given with them than can be done on the labels, I have been obliged to draw up some notice of them.

I have much pleasure in mentioning the attention that has generally been paid to the regulations for drying and labelling the specimens, as well as the paucity of misnomers; and I find that many plants, at present amongst the duplicates, are marked in the greater number of the members' lists of desiderata.

I have to express my obligations to Mr. Watson for his opinion on several plants about the names of which I was in some doubt, and to Mr. T. Moore for his on some of the ferns.

In accordance with Mr. Babington's views (Bot. Gaz. i. 24), I have labelled the *Thlaspi* from Settle "*T. occitanum*, *Jord.*," and that from Matlock, "*T. virens*, *Jord.*"

There is a plentiful supply of *Fumaria parviflora*, *Lam.*, and *F. Vaillantii*, *Lois.*, *Ulex Galii*, *Plan.*, and *Atriplex erecta*, *Huds.*; also of a *Lastrea* from Bawsey Heath, which appears to be *L. uliginosa*, *Newm.* Of *Polygonum laxum*, *E. B.*, *Medicago sylvestris*, *Fr.*, and *M. falcata*, *L.*, *Atriplex deltoidea*, *Bab.*, and *Glyceria Borreri*, *E. B. S.*, a more limited number of specimens have been sent.

I do not intend to mention more than the name of any species included in the third edition of the 'London Catalogue,' but will now consider those which are not included in it, and which will be sent out in the members' parcels, as far as the supply will allow.

1. *Thalictrum flexuosum*, "Rch." Fr.—I collected about fifty specimens of this at North Queensferry, Fifeshire, where it has been long known under the name of *T. majus*. It is a large plant, often four feet

* Read before the Botanical Society of London, February 6, 1852.

high, and very bushy. It differs from *T. majus*, *Jacq.*, in the lateral branches of the petioles leaving the main branch at *acute*, not at *right angles*. I have seen the true *T. majus*, *Jacq.*, on the banks of Loch Tay, but have not seen the fruit of it, which is also said to afford a distinctive character. See *Bab. Man.* 3rd edit. p. 4.

2. *Ranunculus aquatilis*, L. (*Varieties*).—I have dried a series of these, which may be divided into the following forms:—

* Receptacle globose; stigma round.

† Petals large, contiguous; floating leaves usually present.

(1). *heterophyllus*, Bab. Carpels attenuated, not rounded at the apex; upper margin rounded. As this is the most common form in this country, I thought it needless to dry many examples of it, as it is well known by botanists.

(2). *subpeltatus*, Bab. Carpels rounded at the apex, with the upper margin nearly straight, and terminated by the stigma. I sent this from the Castleton of Braemar, Aberdeenshire, and the Down, near Dollar, Clackmannanshire.

†† Petals small, not contiguous; floating leaves absent.

(3). *trichophyllus*, God. This has the peduncles much shorter than in the preceding forms, and the carpels more numerous. My specimens are from a pond close by the sea at Guillon, Haddingtonshire.

** Receptacle ovato-conic; stigma ligulate.

(4). *confusus*, Gr. & G. Stamens longer than the head of carpels, which are attenuated towards the apex (Duddingston Loch); floating leaves rarely present, and only when growing in very shallow water, their segments much narrower than in *heterophyllus* and *subpeltatus*; peduncles very long; carpels numerous.

(5). *Baudotii*, God.? I have great doubts as to the correctness of the label of this form. It differs from the last in having the stamens much shorter, but does not agree with *Baudotii* in having the carpels rounded at the apex, for in my plant they are very like those of *confusus*. It seems to be quite intermediate between *Baudotii* and *confusus* of the 'Flore de France.' Mr. Babington considers it *confusus*; but he had only imperfect and withered specimens, which I sent him by post, to judge from. The specimens were obtained from the same pond as those of *trichophyllus*, mentioned above.

3. *Draba verna*, L., β . *inflata*, Hook.—Plentiful in *debris* at the base

of the rocks of Stuich-an-Lochan, Ben Lawers. I observed no specimens with pouches of the usual form.

4. *Hieracia Species*.—I am quite unable to come to a satisfactory conclusion regarding several forms collected in Breadalbane and Braemar, and therefore should be much obliged by having the opinion of those members to whom they shall be sent.

5. *Grammica suaveolens*, Schr. (*Cuscuta Hassiaca*, Koch).—Mr. Varenne sends some examples of this, an account of which will be found in Phytol. iv. 382.

6. *Sparganium natans*, "L." Fr. (Bab. Man. 3rd edit. p. 338).—I regret I could not procure specimens of *S. minimum*, Fr., to send out along with this; but the latter plant will be that called *S. natans* in most herbaria. As I have given the distinctions of these plants elsewhere (Bot. Gaz. iii. 157; Phytol. iv. 403), I will not again enter on the subject.

7. *Luzula Borreri*, Bromf. (Phytol. iii. 983; Bab. Man. 3rd. edit. 333; Bot. Gaz. iii. 99).—Mr. Purchas sends specimens from Herefordshire. The plant resembles *L. pilosa*, Willd., in habit, much more than *L. Forsteri*, DC., though the seed is nearly the same as that of the latter.

Various.—There are several other varieties, chiefly of ferns, from Mr. Moore; but the label gives all the information that seems necessary.

JOHN T. SYME.

Botanical Society of London,
20, Bedford Street, Covent Garden,
February 6, 1852.

Note on Adonis autumnalis. By THOMAS B. FLOWER, Esq.

IN the 'Phytologist' for this month (Phytol. iv. 397) the Rev. W. T. Bree mentions his having found specimens of *Adonis autumnalis* in a cultivated field in the parish of Darnford, and asks the question, whether it had been introduced among agricultural seeds, or is to be considered a true native, in that locality? I should say, from my own observations in the county for many seasons past, that it is probably not truly wild. I have observed it occasionally at Salisbury, Stonehenge, Fonthill, and Great Ridge; and each of these stations in cultivated fields, where it cannot be depended on two seasons following. And our great Ray, during his botanical excursions through Wiltshire,

in company with his friend Aubrey, tells us they found it "*inter segetes*." In other counties I have observed it under similar aspects, and more or less distributed in some seasons than in others. This was more especially the case in Kent, during the summer of 1846, when it was of frequent occurrence in the neighbourhood of Gravesend, Rochester, Canterbury, Sandwich, Walmer, Dover, and Folkstone; and most, if not all, of these stations were amongst corn-fields. In 1849, when I visited the same line of coast, I could find but few specimens. It had now become a rare plant; and under similar circumstances, no doubt, it has been observed by most of the botanists of the present day.

T. B. FLOWER.

Seend, Melksham,
January, 1852.

Occurrence of Ruppia maritima, Linn., in the North of England.

By JOHN G. BAKER, Esq.

WHILST examining the maritime plants of the neighbourhood of the Tees' mouth last autumn, I met with the true *Ruppia maritima* of Linneus and Babington's Manual, in the broad salt-water ditch bordering the inland bank of the Redcar and Middlesborough Railway, for about a mile, between the village of Coatham and Lazenby Station. I have not before heard of its occurrence on any but the south coast of England, though most likely, when better known, it will be found to be not uncommon, at least on the east coast, as it grows in that neighbourhood in great abundance, and was the only species I found on the Yorkshire side of the estuary of Redcar. It may be readily distinguished from *R. rostellata*, *Koch*, even before the fruit is matured, by its much larger size, elongated peduncles, inflated sheaths, and the perceptible breadth of the leaves. I shall be glad to furnish specimens to any botanist that is not acquainted with it.

JOHN G. BAKER.

Thirsk, January, 1852.

Botanical Chit-chat.

A Perplexing Question.—We have often been perplexed when asked to point out the best botanists. Some may think it a question easy to answer; but it is far from being so. Formerly botanists were more united, and acted more in concert: now they are split into different parties, or schools, if that term is preferred, each pursuing its own way in opposition to the other. There is the physiologist speaking of the labours of the systematic botanist as something worthless and contemptible. The systematic botanist, without hesitation, returns the compliment, and tells his friend to mind what he is about. Then there are the species-makers. The “*hair-splitter*” has taken the utmost pains to make six or eight species of an old one, and sent “*typical specimens*” to all who like to have them (carriage pre-paid); when in comes the “*lumper*,” and throws all the species into one again, telling his colleague, in the mean time, to behave himself, and not augment the overburdened synonymy. Now and then, just to enliven our periodicals a little, we have a skirmish between the “local” and “universal” botanists. We are told it is sometimes quite amusing to see how bewildered people become when taken out of the narrow limits of their country, and, again, how helpless they appear who have the plants of the whole world at their fingers’ end, *except* those growing in their immediate neighbourhood. The difficulties do not terminate here. There are, besides the national differences, a state of feeling which will rather startle those who have been in the habit of looking upon science as a cosmopolitan affair. But so it is. The English and Germans, for instance, are always at each other. The former maintain that they alone can determine new plants, because they have the largest herbaria; while the latter are apt to declare that their neighbours are by no means so well off as they fancy themselves to be, because they are ignorant of literature, and cannot write a monograph without its requiring a supplement before it can be used. We suppose the best plan would be, that either the Germans come to this country, and bring with them their knowledge of books, or that the English, accompanied by their hortus siccus, go over to the Continent. If that cannot be done, pray don’t let us have any more caustic remarks about circumstances that cannot be altered. Now, when reading all the conflicting opinions, and the heated arguments advanced by the different opponents, we trust we shall not be accused of want of discrimination when to the question, “Who are the best botanists?” we

reply, "We do not know." All we do know is, that science is daily becoming more difficult; and that, unless people begin to sober down, and think a little before they favour the world with the result of their investigations, we shall at no distant period find botany in a state to which that of the Angean stables affords no parallel.

Potato Disease.—It is well known that, not only in England, but also in other parts of the world, a belief is current that the introduction of railways has caused the mischief among the potatoes; that the steam and smoke have fallen upon the leaves, and, by a process variously described, proved fatal to the health of the plant. If the thoughtless many entertain such views it can only provoke a smile, but if the thinking few have opinions, if not the same, at least equally absurd, there is reason to assume a more serious countenance. Nearly every scientific man has tried to account for the strange malady, and shown—to his own satisfaction—its true cause. Yet it must be confessed, humiliating as it is, that not one has been able to force his opinion upon more than a limited number of converts. The mystery remains as dark as ever. Like many other phenomena of Nature, the fact of its existence is known: the *how* and *why* are unknown. A Swiss Professor, whose name, for his own sake, we suppress, has tried to dispel the darkness, and discovered a light where it was least expected. He found that a too great accumulation of phosphorus caused the tubers to become rotten. And whence does the phosphorus come? According to our learned friend, from nothing else save the frequent use of phosphoric matches. Had we, like our forefathers, been less impatient to get fire, and, instead of employing lucifers, stuck to the flint and steel, we should not now have to hear the cry of distress from every district in which the potato forms the chief portion of subsistence. Though having no desire to be classed among the thoughtless many, nor any pretension to place ourselves among the thinking few, and though we do not want to launch another hypothesis on the ocean of conjecture, we may be allowed to hint that the potato disease existed long before the invention of railways, and many years before the use of flint and steel came to be relinquished.

Lettuce a Politician.—As a singular, but characteristic, specimen of fanaticism, it may be stated that a Croat, in order to show his hatred for the Hungarians, went so far as to prohibit the appearance of lettuce upon his table, because he recognized in the tender leaves of that plant those hateful colours, red, white, green. We knew that many countries had selected certain herbs and trees for their national emblem, and we have heard people talking about the language of

flowers; but that vegetables should have a political colour is a fact of which we were ignorant.

X. Y. Z.

Botanical Notes and Queries for 1851.

The Exhibition of Scotch Cereals, &c., in the Crystal Palace, by Messrs. Lawson & Son, of Edinburgh.

AMONG the multifarious contents of the Crystal Palace, the botanist will perhaps derive most satisfaction from an attentive examination of this admirable collection. My attention was called to it by a notice in the 'Athenæum,' which is so descriptive and complete that I shall quote it entire, in preference to penning one of my own, merely premising that I would strongly recommend every botanist whose attention it may have escaped to pay it an early visit. An intelligent custodian will be found on the spot, willing to give every information and explanation. "In this department [that of food derived from the vegetable kingdom] will be found a very extensive series of cases and fittings devoted to a display of the vegetable substances used in food, medicine, and the arts, from Scotland. This Scotch exhibition is almost an epitome of the raw produce of the vegetable kingdom throughout the British Islands, as there are few things of any use that will grow in any other part of this country that will not grow in Scotland. These specimens, which have been got together by the Messrs. Lawson & Son, of Edinburgh, will be regarded with interest on account rather of their completeness than of their rarity. Here we have the various cereal grasses of Europe, as wheat, barley, oats, rye, &c., and the varieties which are commonly grown in Scotland, or which are produced in that country as used in other parts of the world. Not only are there exhibited the grains or fruits of those plants which are employed, and the various substances which are manufactured from them, but we have dried specimens of the plant, in blossom and during the time of the ripening of its fruit. The various kinds of farm and garden produce used for food are also represented here. In cases where the vegetable substance could not be kept or dried, wax casts are substituted: thus we have a series of specimens of roots, as carrots, turnips, &c. Casts also of rare specimens of curious forms, and of the varieties cultivated, are exhibited. The grasses grown

and used as fodder for animals are shown on the same scale. On either side of the entrance to the Scotch department, in the south gallery, will be found two living specimens of an interesting grass, the tussack-grass (*Dactylis cæspitosa*), a native of the Falkland Islands, which have been grown in the Western Hebrides, and have produced flowers and seeds; so that it may be hoped this valuable grass may be shortly naturalized among us. Most of our native British plants which are used in medicine are also to be found in this collection. In the glass cases looking north, are a series of blocks of wood, in their rough and in their polished condition, with also dried specimens of the branches, leaves, and flowers of the plants that have yielded them. Those who are anxious to gain a general view of the useful products of the vegetable kingdom in great Britain, we refer with unhesitating satisfaction to this collection of Scotch vegetable products." In conclusion, I would beg to call the attention of British botanists to the debt of gratitude which, as Britons, we owe to the enterprising gentlemen who have taken such great pains to set in order before the eyes of the world the great and varied agricultural resources of our own country. I particularly admire and commend the spirit of nationality which has led these gentlemen into such an outlay of time, trouble, and expense in such a truly praiseworthy cause.—*Edward Newman.*

Aconitum Napellus.

Is this plant collected in any part of the kingdom for medicinal purposes?—*J. R.*

In reply to "J. R."’s query respecting *Aconitum Napellus*, *Linn.* I think it is not collected in any part of the kingdom for medicinal purposes. In fact, it is not the officinal plant of the London College, they having adopted the *A. paniculatum* as their officinal species. Can all the recorded localities for the *A. Napellus* be referred to this or any other species?—*T. B. Flower.*

The root of this plant has been collected for medicinal purposes by Reuben C. Payne, chemist and druggist, Bridgwater, Somersetshire, from the extensive locality in the neighbourhood of Wiveliscombe and Milverton, in the western part of the county. He informs me that the essence he obtains from it is much superior to any he has ever procured in London or anywhere else.—*Thomas Clark.*

The College of Physicians appears to be in error in directing *Aconitum Cammarum* (under the name of *A. paniculatum*) to be employed exclusively, since Dr. Fleming has shown this species to be feeble and unimportant in its action, and that *A. Napellus* is the only species of any value. Both species are diuretic, but *A. Napellus* much the more powerful of the two. See *Veg. Kingdom*, p. 427, &c.—*Edward Newman*.

Lastrea uliginosa.

We have now so many cultivators of ferns who are qualified to give an opinion of the value of this species, that all doubts on the subject might be resolved by the faithful record of the results of their observations. I shall be very grateful for communications on the subject.—*Edward Newman*.

Having paid some attention to *Lastrea uliginosa*, both wild and cultivated, I unhesitatingly state that it is a species totally distinct from *L. cristata*; and it is a matter of surprise to me how any botanist can consider these two ferns identical, or indeed confound *L. cristata* with any other British species. If *uliginosa* is only a variety, it must be of *L. spinosa*; but I am strongly inclined to consider it a good species. It grows plentifully around the margins of ponds in the forest, among the shallows; and it might at first be supposed that its peculiar, slender, drawn-up appearance arose from the situation; but this is not the case: it preserves the same characters in my garden, planted in an open border; and its appearance is widely different from a bed of *spinosa* planted by its side. It begins to throw up its fronds rather earlier in the spring than *spinosa*, and in this respect widely differs from *cristata*. On the first of the present month (June) the fronds of *cristata* had scarcely begun to move, while those of *uliginosa*, growing by its side, were two feet high. I may also observe that the fronds of *uliginosa* begin to decay early in autumn, and quite perish in the winter, in our forest, while those of *spinosa* continue green till the spring.—*Henry Doubleday*.

It will be interesting to the students and cultivators of British ferns to know that Mr. Babington, in the third edition of his *Manual*, which has just issued from the press, places this fern under *L. cristata*. We have therefore three totally opposed opinions published by eminent botanists on this supposed species.

Bree and Wilson pronounce it to be identical with *Lastrea spinosa*, *Newm.*

Hooker and Arnott declare it to be the type of *Aspidium spinulosum*, *Willd.*

Moore and Babington declare it to be *L. cristata*.

Perhaps there are not six botanists in the kingdom who would be esteemed more competent judges than those named above: they are our leaders, our teachers, our *docteurs-es-sciences*. "Who shall decide when doctors disagree?" I shall still feel obliged by the free expression of opinions as to the distinctness or otherwise of this fern.
—*Edward Newman.*

Orchis hircina in Kent.

I am recently informed of another station for this rarest of our British Orchideæ, in the county of Kent. It is on the chalk between Shoreham and Farningham. I shall feel extremely obliged to the gentleman who communicates this information if he will prosecute his inquiries, obtain a sight of the specimen, and report in a future number of the 'Phytologist.'—*Edward Newman.*

I have now in my possession a very fine flowering plant of *Orchis hircina*, brought to me on Good Friday of the present year, by an intimate friend, from a locality which I showed him last year, and where we found five small plants of the same. The locality is in the neighbourhood of the old station mentioned in Sowerby's 'British Botany.'—*George B. Wollaston.*

[I have learned, since the publication of the preceding, that twelve good plants have been found in the old locality during the summer of 1852.—*E. N.*]

Asplenium fontanum.

With respect to *Asplenium fontanum* being considered a British species, I will supply you with all the information I possess respecting it. On the south-west side of Tooting Common is situated an isolated mansion, called Furze Down, the property of — Haigh, Esq., commanding a most delightful and picturesque view over the Surrey and Kentish hills. At this place *Asplenium fontanum* was wont to luxuriate somewhat plentifully, in the crevices of an old wall, whence

I obtained plants, and supplied my friends therewith, through the kindness of Mr. Gibbs, who was gardener to the late Mr. Haigh for more than thirty years. Certainly it must have taken possession of this locality before his time, as it was not until within the last five or six years that Mr. Gibbs accidentally became aware that he possessed so desirable a fern; for, although an excellent gardener, he had not at that time turned his attention to the cultivation of ferns. Last week I paid a visit to Furze Down, for the purpose of obtaining specimens of *A. fontanum*; but, alas! it was *non est*, the walls having been scraped, cleaned, and fresh pointed. Consequently not a vestige of the object of my search was to be met with; but possibly, in time, it may again peer through the crumbling mortar. How far this may go to establish its claim as a British fern I must leave for others more competent than myself to decide. Herewith I forward you a frond, gathered from one of the two plants which I now possess, one of which I shall feel much pleasure in sending, if you will accept of it, gathered from the above locality.—*C. Wood*.

[The frond sent is the divided form described as a distinct species, under the name of *Asplenium Halleri*.—*E. N.*]

Why is this species omitted in recent works on ferns?—*I. V. V.*

[Because I can find in no herbarium a frond, or even a fragment of a frond, gathered within the United Kingdom of Great Britain and Ireland. The fern found at Kirk Hammersham, or “Hammersham Church,” as Hudson has it, appears to have been *Cystopteris fragilis*. I shall regard it as a most inestimable service if any correspondent will furnish me with the means of restoring this elegant fern to the British list.—*E. N.*].

Grimmia ovata.

I was a short time, in January, in the neighbourhood of Charnwood Forest, and found the *Grimmia ovata* (a moss extremely rare out of Scotland) on the *debris* of slate from the quarry in Swithland Wood.—*R. C. Douglas*.

Atriplex hortensis.

Having had my attention called to the finding of the *Atriplex hortensis* by Mr. Lees, I went to the locality, with but little hopes of

finding any of it left, as it was said to flower in June. However, I did find some plants in seed, not exactly in the same spot, but within a few yards of where he said he found it. It is, I am sorry to say, too far gone for herbarium specimens, but in prime order for propagation; and I enclose you a small portion of the seed, to sow in your garden. It appears to me a very singular plant, for, if I am right in my conjecture, it produces seeds in two very different-formed vesicles, the one a five-cleft regular calyx, the other a double-winged vesicle.—*George Reece*.

[I have submitted this note and the seeds to Mr. Watson, who has kindly sent the following explanation, which I beg to hand to Mr. Reece, through the pages of the 'Phytologist.'—*E. N.*]

If your correspondent can turn to page 268 of Babington's Manual, second edition, he will there see the genus *Atriplex* divided into two sections;—one of them, "Monœcious; female flowers bipartite;"—the other, "Polygamous; female flowers bipartite to the base, seed vertical; perfect flowers 3-5 parted, seed horizontal." The former section includes all our native species; excepting those removed to the genus or sub-genus *Halimus*. The latter section includes only *Atriplex nitens*, in the Manual, but would have also included *A. hortensis*, if the author had considered it worth while to describe an ordinary garden plant, on account of its occasional appearance on rubbish-heaps and in waste ground, as a straggler from cultivation. I have frequently seen stray plants of *Atriplex hortensis* by the roadsides in north Surrey, just as I have seen stray plants of the garden cress, celery, parsley, lettuce, *Asparagus*, &c. But I do not perceive any value to science in the record of such *accidental* facts; which must be familiar enough to observant botanists, who are dwellers in the country. In the case of a permanent habitat being made, or one enduring for successive years, a record may be worth its ink and paper.—*H. C. Watson*.

Villarsia Nymphæoides.

Those interested in the rapid extension of water-plants will be pleased with the examination of an enormous plant of *Villarsia* which is now choking up a comparatively recent basin of the Surrey Canal, just by the gas-works on the Kent Road. It occurs abundantly in many other parts of the same canal.—*Edward Newman*.

Vinegar-plant.

A gentleman obligingly brought to me, some weeks ago, a specimen, so called. It was about the size of a cheese-plate, and perhaps half an inch in thickness, of a jelly-like appearance and consistency, and had a very powerful smell of vinegar. The following queries occur to me as worthy of notice :—

Is this plant the Tremella Nostoc of old authors, Nostoc commune of Harvey, &c., or what is its real name and order ?

Is it generally, or even frequently, used in the manufacture of vinegar, and in what way does it assist in that operation ?

Where is it found, or how is it cultivated ?

The mention of this plant in the report of the proceedings of the Edinburgh Botanical Society recalled it to my recollection.—*Edward Newman.*

I wish to make a few observations in answer to your three questions relating to the vinegar-plant. *First*, that it is not Tremella Nostoc of Linneus, for that author describes the species as plicate-undulate and terrestrial. The plant which I have always taken for T. Nostoc, and which answers to the description, is sometimes found upon commons and other waste lands, in similar situations to Clavaria coralloides. It appears about the latter end of September, is of a gelatinous substance, from six inches to a foot in diameter, about an inch in thickness, of a dirty-white colour, and a shape bearing a great resemblance to that part of the entrails of a hog which is called the “crow.” It is widely distributed, but is not very frequently met with. Most old farmers, keepers, shepherds, &c., are acquainted with it under the name of star-jelly, and have an idea that it is caused by a falling star; and the explanation given to the word “Nostock” in Bayley’s Dictionary fully corresponds with that idea. It is so curious that I shall here transcribe it :—“Nostock, stinking tawny jelly of a fallen planet, or the nocturnal solution of some plethoretical and wanton star.” I am seldom out fern-collecting after the month of June; therefore I can give no locality for it near London; but a friend of mine informs me that he has seen it in several places in the county of Surrey, particularly Radmore Common, near Box Hill. *Secondly*, it has not, that I am aware of, been ever used to any extent in the manufacture of vinegar; but a piece of it put into a jar half filled with water, and placed in a warm temperature, will so acidulate the water, that it will in a few weeks become tolerable vinegar. *Thirdly*, I am of opinion, though perhaps erroneously, that it has a near affinity to the gelatinous substance called “mother,” which grows in vinegar, and particularly

in verjuice, and which, when allowed to remain undisturbed for a length of time, will become as large and as compact in its texture as the vinegar-plant. Mr. Kennedy, of Covent Garden, would, I think, be able to give some more correct information, for I know him to be a successful cultivator of this plant.—*John Lloyd.*

About two years ago I inquired of the Rev. M. J. Berkeley what this really was, and found that he considered it a form of *Penicillium crustaceum* of Fries, which is described in the fifth volume of the ‘English Flora.’—*A. Bloxam.*

‘*Natural Systems of Plants.*’

Under this title Dr. Drummond has very forcibly stated, in the present number, his objections to the term ‘natural,’ as applied to the physiological systems now universally employed in botanical science. Now, without any idea of strengthening the Doctor’s cause, which he is quite competent to defend, but with a desire of making known my own notions on this subject, I venture to express my entire concurrence in the views which he has expounded with such ability. There must be a natural system, but that system is Divine; and none of our various systems, however ingenious their construction, can be supposed Divine: they are not only apparently but avowedly human; they are the work of man’s brain—the result of his powers of constructiveness. But although this general definition obtain with all, still I think a difference exists in the fact that the Jussieuian systems aim at the *natural*, while the Linnean aims at and achieves the *convenient*. To those who require more general terms than Jussieuian and Linnean, I would venture to suggest the terms ‘physiological’ and ‘arithmetical,’ as not only being inoffensive to those who deprecate the distinction of ‘natural’ and ‘artificial,’ but also as possessing the great merits of being descriptive and truthful. Physiological systems are founded both on the physiological characters and intimate structure of the plant; arithmetical systems depend on the number of certain parts of a plant. I would, therefore, venture to suggest that, until that distant day when a *really* natural system shall have been discovered, not manufactured, the terms ‘physiological’ and ‘arithmetical’ be employed when there is any necessity of contrasting the merits of these conflicting methods.—*Edward Newman.*

Sempervivum tectorum.

How comes this plant in all our floras? I never saw a British specimen, recent or dried, and never met with a botanist who had that pleasure.—*Querist.*

[It is one of those time-hallowed errors which continue to exist in the face of fact. The *Sempervivum* is one of those few hardy plants which not only is not native, but will not escape or make any attempt to naturalize itself. It has little better claim to be considered a British plant than the dragon-tree of Oratava. The authors of our two descriptive lists of British plants appear to have exercised but slender judgment in the retention or rejection of species as native.—*E. N.*]

Antirrhinum majus.

The query respecting *Sempervivum tectorum*, which certainly has not the slightest claim to a place among British plants, induces me to ask whether any reader has ever seen *Antirrhinum majus* in a native habitat, and also what is its native country. In a continental trip last summer I saw it nowhere but on garden-walls and rubbish-heaps in stony places, where it was evidently the outcast of a garden.—*Y.*

Angelica Archangelica.

In five editions (perhaps also in the first) of the 'British Flora' we have the habitat of this plant recorded as "Thames' side near Dorking." Pray inform me in what part of the United Kingdom this may be.—*T. W.*

[I have no idea. Will any reader kindly offer an explanation?—*E. N.*]

Seeing there is no such locality as that indicated on your last wrapper, it follows there is a gross error somewhere. This may possibly extend beyond the limits of Britain; and it seems by no means impossible that some European station has been thus transmogrified.—*Y.*

British Cyclamens.

A correspondent, in allusion to an observation of my own in the Preface, inquires whether I suppose we have two British species of

Cyclamen, what are their names, and how are they to be distinguished? Will some more able botanist than myself reply to this? I have never seen the plant in a native locality, but have a fine root, purchased of the late James Potter, and said by him to have been found in Sussex. It was in full bloom in October, and bore scarcely any resemblance to the figure in 'English Botany.'—*Edward Newman.*

Whether there exist two species of Cyclamen in England or not I cannot say, never having had the pleasure of finding the Cyclamen wild. There are, however, certainly two distinct species, *C. europæum* and *C. hederæfolium*. The following descriptions, translated from a 'Flora of the Canton of Vaud,' will clearly show the great difference between these two species:—

C. europæum.

Leaves almost orbicular, heart-shaped, crenulate, appearing with the flowers; corolla pink. Perennial: May and August.

C. hederæfolium.

Leaves heart-shaped, acuminate or elongate, angular, and crenulate, appearing after the flowers; corolla pink or white. Perennial: September and October.

—*H. L. de la Chaumette.*

Derivation of the Name "Osmunda" (Filices).

The derivation of this name seems to be uncertain as yet. In the last edition of the 'British Flora,' by Sir W. J. Hooker and Dr. Walker-Arnott, it is supposed to have been derived from two Saxon words, *os*, signifying house, and *mund*, peace, "domestic peace." I should feel much obliged to any of our learned botanists if they would say whether the translation of the term, as in Linneus's 'Alphabetical Table of the Etymology of Genera,' at the end of his 'Vegetable Kingdom,' is not to be relied upon. He states there that it is derived from the Latin *osmundare*, to wash the mouth. Is this at all likely to be the proper derivation, and, if so, how would it be applied to the fern?—*H. L. de la Chaumette.*

Wiltshire Locality for Sedum sexangulare.

I have recently been applied to by various correspondents for specimens of *Sedum sexangulare* from the walls of Old Sarum; also to ascertain whether it is growing there in any great plenty. I have

therefore thought it better to reply, through this medium, to those who are desirous of obtaining the plant, that I am fearful it is now *lost*. One plant was found on the walls in 1845, after a most diligent search; and I am not aware that it has since been met with. In July, 1848, I spent some time in searching for it, and again last summer, but without success. Specimens obtained by Mr. Dawson Turner in 1800, from the above locality, are preserved in the herbarium of the late Sir J. E. Smith. Has the plant been met with in any of its other recorded localities of late?—and can such localities now be relied upon? It has also been asked whether the present species can be considered a true native on the walls of Old Sarum. I should say it is doubtful and unsatisfactory, and should not myself consider it a truly native species in this county; and, by its being placed as an “alien” in the ‘*Cybele Britannica*,’ I should question its being a true native in its other published localities.—*T. B. Flower.*

Hybrid Narcissus.

In the group of *Narcissi* figured in the ‘*Gardener’s Magazine of Botany*’ (Phytol. iv. 218) there is one named *Leedsii*, which seems exactly intermediate between *Narcissus poeticus* and *N. Pseudo-narcissus*. By a parity of reasoning with that employed in the case of the *Primulæ*, the production of this hybrid would prove the identity of these two *Narcissi* as a species, a conclusion which, I think, botanists will not be hasty to adopt.—*Edward Newman.*

Effects of Light and Heat on the Expansion of Flowers.

The observations on this subject at p. 155 are extremely interesting; but the conclusions deduced are not sufficiently precise. The flowers expanded at night, in the meeting-room, “under the influence of gas-light;” they also opened “in the absence of light,” in “a warm plant-stove, the temperature of which was about sixty-three degrees.” The question naturally arises, What was the temperature of the meeting-room?—was it lower than that of the plant-stove?—was it not sufficiently high to account for the expansion of the flowers without having recourse to the aid of gas? The conclusion deduced is, that in the first instance light caused the expansion, in the second, heat; but such a conclusion is not logical. The experiments ought to be

made—1st, in a room naturally lighted; 2ndly, in a room artificially lighted by gas; and 3rdly, in a room totally dark. They ought to be made in cold weather, say with a temperature of 35° Fahr.; and this temperature should in each instance be artificially increased until the flowers expanded; then, if the flowers were found to expand in the naturally-lighted room at 45°, in the artificially-lighted room at 50°, and in the dark room at 55°, we should have precise, appreciable, and really interesting results, more especially if a series of experiments established these phenomena as unvarying.—*Edward Newman.*

Adulteration of Tea.

The adulteration of coffee has lately proved a prolific source of interest to the British public. How much more interesting to *British* botanists it would be to learn what *British* herbs are employed in the manufacture of tea. It is said that the weight annually imported of real tea bears but a very small proportion to that retailed under the name. The inquiry is highly interesting, not only in a statistical and economical but also in a botanical view.—*Edward Newman.*

Claytonia perfoliata in Britain.

I enclose specimens of *Claytonia perfoliata*, I think an American species, which is found in great abundance at Ampthill, on a sandy bank not near any garden; and I am informed that it has grown there for several years, and increases in abundance every year. I cannot learn that any one has it in cultivation in the neighbourhood.—*T. Corder.*

[This little plant, very similar in habit, &c., to our *Montia fontana*, belongs, like that, to the *Natural Order* Portulacææ. “*Claytonia perfoliata*, *Don*; *Bot. Mag.* 1336. North America; introduced 1794. Very hardy, and not easily eradicated where once introduced. It grows on the poorest soil, vegetates early, and the whole of the herbage gathered and boiled makes a very tender spinage.”—*Loudon’s Encyclopædia of Plants.* *C. virginica*, *caroliniana*, *lanceolata*, *sibirica*, and *alsinoides* are other species.—*E. N.*]

NOTICES OF BOTANICAL PERIODICALS, &c.

‘Neue Allgemeine Deutsche Garten und Blumenzeitung, redigirt von EDUARD OTTO. Siebenter Jahrgang. 8vo. Hamburg: 1851.’

Such is the title of a magazine which, though mainly devoted to horticulture, contains a great amount of botanical information, including selections from the best foreign authors, and contributions by Lehmann, Nees von Esenbeck, Reichenbach, Römer, Steetz, and others. Distinguished as a traveller in tropical America, and well known as a successful cultivator of plants in the capacity of Curator of the Botanic Garden at Hamburg, M. Edward Otto, like his illustrious father, is eminently qualified to exercise the office of editor. From the time that M. E. Otto has undertaken the chief management, the journal, from being a mere local paper of no influence or importance, has become one of the best periodicals in Northern Germany; and many of the minor publications, as well as those enjoying a wider circulation, are constantly filling their columns with extracts from it. A peculiar feature of the paper is its “*feuilleton*,” containing a mass of personal news, the doings of eminent men, reports of learned societies, &c., a species of journalism hitherto sadly neglected. Botanists of one country are mostly ignorant of what is doing in others; and writers frequently treat a subject as something new and original, when, indeed, they are only repeating what has already become a matter of history in the territories of their neighbours. To those, therefore, who are eager to know more than what happens at home, we strongly recommend this journal, which, we sincerely hope, will meet with all the success it deserves.

X. Y. Z.

‘The Annals and Magazine of Natural History,’ No. 49, January, 1852.

The botanical paper in this number is intituled:—

‘Notice of a New British Viola; by Charles C. Babington, M.A., F.R.S.’

The details of this paper were given in our January number (*Phytol.* iv. 424).

PROCEEDINGS OF SOCIETIES.

Botanical Society of London.

Friday, February 6, 1852.—John Reynolds, Esq., Treasurer, in the chair.

The following donations were announced:—British plants from Mr. Hewett C. Watson, Mr. G. Maw, Mr. J. A. Brewer, Mr. W. Gourlie, and Mr. Ibbotson. ‘Journal of the Royal Agricultural Society of England;’ presented by the Society. ‘The Gardener’s Companion and Florist’s Guide’ for February; presented by the Editors. ‘The Pharmaceutical Journal and Transactions;’ presented by the Pharmaceutical Society. ‘Journal of the Statistical Society of London;’ presented by the Society.

The following paper was read:—

‘Notes on some of the British Plants for Distribution to the Members of the Botanical Society of London in 1852;’ by John T. Syme, Esq., Curator to the Society (see p. 468).—*G. E. D.*

Microscopical Society of London.

December 21, 1851.—Dr. Lankester in the chair.

A paper by J. H. Huxley, Esq., entitled ‘*Lacinularia socialis*, a Contribution to the Anatomy and Physiology of the Rotifera,’ was read. The author commenced by stating that the *Lacinularia socialis*, a very singular and beautiful Rotifer, was found by him, in great abundance, on leaves of *Ceratophyllum*, in the River Medway, a little above Farleigh Bridge; and as they present especial advantages for microscopical investigation, on account of their relative large size, their transparency, &c., he had availed himself of an opportunity which occurred to him, of inquiring somewhat minutely into their structure. He proceeded to mention their general appearance and habits, and then entered more minutely into the description of their various organs, *viz.*, the trochal disk (which he stated to be wide and horse-shoe shaped, the edges being richly provided with large cilia, presenting a very beautiful and wheel-like movement), the mouth and its appendages, the œsophagus, and the intestines. He next described the water vascular system, quoting at the same time the opinions of

various other observers upon this part of the subject. He next mentioned appearances which he terms vacuolar thickenings, some of which he stated to have been considered by Prof. Ehrenberg as ganglia, others as testes, &c., but, in the author's opinion, erroneously, inasmuch as they appear to him to be merely local thickenings of the parietes in various parts of the body. The nervous system, or organs of sense, were then described; and some remarks on the reproductive organs followed, in which some curious observations on the development of the ova were given, showing that the process is exactly that which takes place in all fecundated ova, and leading to the supposition that Spermatozoa should, somewhere or other, be found. He, however, had not been able to satisfy himself of their existence, although he had seen objects which answered precisely to Kollicher's description of the Spermatozoa in *Megalotrocha*, and expressed his opinion that it was impossible, in the present state of our knowledge, to come to any definite conclusion upon the subject. He next proceeded to make some remarks on the asexual propagation of *Lacinularia* and other Rotifera, in which he pointed out the difference between the ordinary ova and those called "winter ova," which last he proposes to call ehippial ova. The development and progress of these last were very fully described; and he concludes this part of the subject by stating that "there are two kinds of reproductive bodies in *Lacinularia*: 1st, Bodies which resemble true ova in their origin and subsequent development, and which possess only a single membrane; 2ndly, Bodies half as large again as the foregoing, which resemble the ehippium of *Daphnia*, like it, have altogether three investments, and which do not resemble true ova, either in their origin or subsequent development, which, therefore, probably do not require fecundation, and are thence to be considered as a mode of asexual reproduction." He then proceeded to make some remarks on the zoological position of the Rotifera, as deduced from the structure of the *Lacinularia*, as now described; and, after pointing out that the relations between the Polyzoa and the Rotifera were at the best only mere analogies, he stated that the general agreement in structure between the Rotifera and the Annuloidæ (under which term he includes the Annelidæ, the Echinoderms, the Trematodæ, Turbellaria, and Nematoideæ) is very striking, and such as to constitute an unquestionable affinity. This position he proved by numerous examples, and concluded by giving a sketch of the affinities of the Annuloidæ, in which class he proposes to place the Rotifera, thus removing them entirely from the class Radiata of Cuvier, in which they have hitherto been included.

January 28, 1852.—Dr. Arthur Farre, President, in the chair.

The minutes of the preceding meeting were read and confirmed.

Two presents were announced, and the thanks of the Society voted to their respective donors.

Certificates in favour of L. S. Beale, Esq., 12, Wilton Place; Dr. Hamilton, Grafton St., Bond St.; and Charles C. Smith, Esq., Bury St. Edmunds, were read, and ordered to be suspended in the meeting-room.

Wm. King, Esq., and Henry Perigal, jun., Esq., were balloted for, and duly elected Members of the Society.

Messrs. H. H. White and H. Deane were appointed Auditors of the Treasurer's account for the past year.

A paper by the Secretary, John Quekett, Esq., 'On the Structure of Raphides,' was read. The author commenced by stating that inorganic substances were formed in plants under two circumstances: first, in crystals, as in the case of phosphate and oxalate of lime; second, as a portion of the tissue, as in the case of silica in the bark of equisetaceous and gramineous plants. The crystals were stellate or single, from the $\frac{1}{40}$ th to the $\frac{1}{1000}$ th of an inch in diameter. Single crystals of oxalate of lime were octohedral; those of phosphate of lime were acicular. Numerous plants were referred to in which raphides were found, as in many species of Cactus, the lime, rhubarb, elm, apple, onion, and other plants. The author exhibited drawings of artificial raphides, which had been prepared in the tissue of rice paper, by the late Mr. Edwin Quekett, by immersing the cells, first in lime water, and afterwards in oxalic acid. In conclusion, the author gave a detailed account of some stellate raphides which he had found in great abundance in a species of Cactus. On dissolving up the inorganic matter of these crystals, by means of hydrochloric acid, he was surprised to find that an organic base was left perfectly similar in form to that of the crystal which had been dissolved. From this fact Mr. Quekett inferred that all these crystals were deposited with organic nature. He referred to the structure of calculi in the human and animal body, which, he stated, were always deposited upon or with an organic base, as proof that this law was general, and that the deposition of inorganic salts in the tissues of plants and animals was always connected with the growth of organic matter.

A paper by the Rev. J. Thornton, 'On the Pupa of an Insect bearing considerable resemblance to an Aphis,' was read. A few meetings since specimens and a drawing of the exuviae of an insect whose head, body, and legs were beautifully fringed with leaf-like appendages, were

exhibited to the Society. Since that time the author has continued his researches; and the object of the present communication was to show that he considered he had discovered the insect to which these exuviæ belong. His reasons for inferring that the insect now described is the one produced from the exuviæ before mentioned, are founded—1st, on the habitat, the exuviæ, pupa, and imago having been found on the same leaf of *Acer campestre*; 2nd, on the colour and texture; 3rd, on the general form and aspect; and 4th, on the similarity of the details of the antennæ, and other particulars, among which the change of the leaf-like appendages in the pupa to corresponding bristles in the perfect insect, was mentioned, leading, in his opinion, to the inference that the *Phyllophorus testudinatus*, as he proposed to call it, is the pupa of an undescribed species of *Aphis*, forming a new species, if not a new genus.—*J. W.*

Botanical Society of Edinburgh.

Thursday, March 12, 1852.—Professor Balfour, Vice-President, in the chair.

The following donations to the library were announced:—‘The Boston Journal of Natural History,’ containing papers read before the Boston Society of Natural History, from the Society; ‘The Natural History, Physiological Actions, and Therapeutic Uses of *Colchicum autumnale*,’ by J. M’Grigor MacLagan, M.D., from the author; ‘The Garden Companion and Florists’ Guide,’ from Mr. Moore, the conductor; List of British Mosses, from Mr. Stark.

Dr. Balfour announced that Dr. Greville had presented an additional collection of Fungi to the Society’s herbarium. Among them were some very good species from Jamaica, communicated and determined by Kunze; others from Schweinitz, of North Carolina, which are authentic for many of his published species.

Dr. Balfour also announced that the University herbarium had been enriched by specimens from Mount Olympus, collected by Clementi, and by a parcel of 316 species of well-dried plants from the Rio Negro district, collected by Mr. Spruce and named by Mr. Bentham.

Dr. Balfour announced the following donations to the museum at the Botanic Garden, received since the last meeting of the Society:—From Dr. Gilbert M’Nab, Kingston, Jamaica:—Four spadices of the cabbage palm, two of them in spathes three feet six inches long, and two without; a quantity of very light powdery matter, which is scat-

tered when the spathe bursts ; three spadices and spathes of the cocoa-nut palm (*Cocos nucifera*), in different stages ; several specimens of the reticulum of the cocoa-nut palm, used for mats and for coarse cloths ; upper portion of the stem of *Cycas revoluta*, in fruit ; large section of *Lignum vitæ* (*Guaiacum officinale*), covered with guaiac resin ; four fruits of the calabash (*Crescentia Cujute*), in the form of water-jars, basins, and cups ; three cups made from the cocoa-nut, by the Indians of New Granada, one mounted with silver ; one small drinking cup, made of the last-matured fruit of an aged cocoa-nut tree (Jamaica) ; two sections of lace bark (*Lagetta lintearia*) ; two horse halters, made from the lace bark (Manchester, Jamaica) ; bark of a tree from Baranquilla, N. Grenada ; hammock made from a grass from the Indian coast ; pigment made from a plant, by the San Blas Indians, and used for painting their bodies, to protect them from the sun ; three Fungi from Jamaica ; club from the Indian Main, made from the stem of *Acrocomia fusiformis* ; a quantity of Port Royal senna (*Cassia obovata*, var. *Porto-regalis*) ; a jar of wongloo seed (*Sesamum indicum*) ; three bottles containing the cashew apple and nut (*Anacardium occidentale*), one preserved with white sugar ; specimen of *Spathelia simplex* (mountain-pride of Jamaica) ; specimens of the hog-gum (*Moronobia coccinea*) ; specimens, in fruit, of the arnotto (*Bixa orellana*). From Mr. M'Intosh, Dalkeith Park :—Three flowering panicles of the Pampas grass (*Gynerium argenteum*). From Messrs. P. Lawson & Son, Nurserymen to the Highland and Agricultural Society :—Thirty varieties of New-Holland cones and seed-vessels. From Professor Christison :—Specimens of the root of *Aucklandia Costus* (spikenard of the ancients), and specimens of a small-fruited tamarind, from Saharunpore. From Mr. Baxter, Riccarton :—Branch of *Pinus Pinaster* bearing cones. From Major Madden :—Specimens of the root of *Nardostachys jatamansi* (spikenard) from the Upper Himalaya of Busekur (Simla) ; paper made from the bark of *Daphne cannabina*, at Kumaon, which is not attacked by insects in India ; *Nima quassioides*, bitter wood from Budureenath, in Gurhwal ; seed-vessels of *Sapindus emarginatus* (soap berries) from Almorah, in Kumaon, where they are called “reetha,” (the seed-vessels are used for washing silk, hair, &c.) ; poison, supposed to be the bikh, the root of *Aconitum ferox* ; specimens of frankincense sold in the shops at Almorah ; specimens of butter procured from *Bassia butyracea*, at Kumaon, with seed of the plant (the butter, or concrete oil, is edible, but is chiefly valued for pomades) ; seeds of rooquee, a cruciferous plant, from the altitude of 12,000 feet, in Kumaon (the flowers have twelve

stamens, owing to the development of the glands, and the plant is probably allied to *Megacarpæa*. From Dr. Thomas Anderson:—Roots of the *Hemidesmus indicus* (Indian sarsaparilla); stems and flower of sugar-cane; fruit of the nicker-tree (*Guilandina Bonduc*), preserved in fluid; bottle of colouring matter from *Rottleria tinctoria*; roots of *Morinda citrifolia* (or sooranjee), which yields a peculiar colouring matter, called “morindine.” From Mr. Reid, Millbank:—Three fruits of *Tacsonia mollissima*. From Professor Traill:—Fruit of the li-chi (*Dimocarpus Lichi*). From G. S. Blackie, Esq.:—Specimens of the German tinder obtained from *Polyporus igniarius*; piece of a ship’s plank bored by *Teredo navalis*; seeds of *Entada scandens*; fine specimen of fossil dicotyledonous wood. From Mr. John M’Phail:—Hazel-nuts taken from a large peat-moss drain in the Island of Lewis, nine feet below the surface.

The following papers were read:—

1. ‘On the Uses of *Stillingia sebifera*, or Tallow-tree of China,’ being the substance of a communication made to the Agricultural and Horticultural Society of India; by D. J. Macgowan, M.D.; communicated by Dr. Coldstream. The botanical characters of this euphorbiaceous plant are too well known to require description; but hitherto no accurate account has been published of its varied uses; and, although it has become a common tree in some parts of India and America, its value is appreciated only in China, where alone its products are properly elaborated. Dr. Macgowan remarks:—“The *Stillingia sebifera* is prized for the fatty matter which it yields; its leaves are employed as a black dye; its wood, being hard and durable, is used for printing blocks and various other articles; and, finally, the refuse of the nut is employed as fuel and manure. It is chiefly cultivated in the provinces of Kiangsi, Kongnain, and Chehkiang. In some districts near Hangchan the inhabitants defray all their taxes with its produce. It grows alike on low alluvial plains and on granite-hills, on the rich mould at the margin of canals, and on the sandy seabeach. The sandy estuary of Hangchan yields little else. Some of the trees at this place are known to be several hundred years old, and, though prostrated, still send forth branches and bear fruit. In midwinter, when the seed-vessels are ripe, they are cut off with their twigs, by a sharp crescentic knife, attached to the extremity of a long pole, which is held in the hand, and pushed upwards against the twigs, removing at the same time such as are fruitless. The capsules are gently pounded in a mortar, to loosen the seeds from their shells, from which they are separated by sifting. To facilitate the separa-

tion of the white sebaceous matter enveloping the seeds, they are steamed in tubs having convex, open, wicker bottoms, placed over cauldrons of boiling water. When thoroughly heated they are reduced to a mash in the mortar, and thence transferred to bamboo sieves, kept, at a uniform temperature, over hot ashes. A single operation does not suffice to deprive them of all their tallow; the steaming and sifting is therefore repeated. The article thus procured becomes a solid mass on falling through the sieve; and to purify it, it is melted, and formed into cakes for the press. These receive their form from bamboo hoops, a foot in diameter and three inches deep, which are laid on the ground, over a little straw. On being filled with the hot liquid, the ends of the straw beneath are drawn up and spread over the top, and when of sufficient consistence are placed, with their rings, in the press. This apparatus, which is of the rudest description, is constructed of two large beams, placed horizontally, so as to form a trough, capable of containing about fifty of the rings, with their sebaceous cakes. At one end it is closed, and at the other adapted for receiving wedges, which are successively driven into it, by ponderous sledge-hammers, wielded by athletic men. The tallow oozes, in a melted state, into a receptacle below, where it cools. It is again melted, and poured into tubs smeared with mud, to prevent its adhering. It is now marketable, in masses of about eighty pounds each, hard, brittle, white, opaque, tasteless, and without the odour of animal tallow. Under high pressure it scarcely stains bibulous paper; melts at 140 deg. Fahr. It may be regarded as nearly pure stearine; the slight difference is doubtless owing to the admixture of oil expressed from the seed in the process just described. The seeds yield about eight per cent. of tallow, which sells for about five cents per pound. The process for pressing the oil, which is carried on at the same time, remains to be noticed. It is contained in the kernel of the nut, the sebaceous matter, which lies between the shell and the husk, having been removed in the manner described. The kernel and the husk covering it are ground between two stones, which are heated, to prevent clogging from the sebaceous matter still adhering. The mass is then placed in a winnowing machine, precisely like those in use in western countries. The chaff being separated, exposes the white oleaginous kernels, which, after being steamed, are placed in a mill to be mashed. This machine is formed of a circular stone groove, twelve feet in diameter, three inches deep, and about as many wide, into which a thick, solid, stone wheel, eight feet in diameter, tapering at the edge, is made to revolve perpendicularly, by an ox harnessed

to the outer end of its axle, the inner turning on a pivot in the centre of the machine. Under this ponderous weight the seeds are reduced to a mealy state, steamed in the tubs, formed into cakes, and pressed by wedges in the manner above described; the process of mashing, steaming, and pressing being repeated with the kernels likewise. The kernels yield above thirty per cent. of oil. It is called "ising-yu," sells for about three cents per pound, answers well for lamps, though inferior for this purpose to some other vegetable oils in use. It is also employed for various purposes in the arts, and has a place in the Chinese pharmacopœia, because of its quality of changing gray hair black, and other imaginary virtues. Artificial illumination in China is generally procured by vegetable oils; but candles are also employed by those who can afford it. In religious ceremonies no other material is used. As no one ventures out after dark without a lantern, and as the gods cannot be acceptably worshipped without candles, the quantity consumed is very great. With an unimportant exception the candles are always made of what I beg to designate as vegetable stearine. When the candles, which are made by dipping, are of the required diameter, they receive a final dip into a mixture of the same material and insect-wax, by which their consistency is preserved in the hottest weather. They are generally coloured red, which is done by throwing a minute quantity of alkanet root (*Anchusa tinctoria*), brought from Shantung, into the mixture. Verdigris is sometimes employed to dye them green."

2. 'On *Victoria regia*, *Lindl.*;' by Mr. Edward Otto, Curator of the Hamburg Botanic Garden; communicated by Mr. G. Lawson. This communication consisted of an account of the mode of treatment adopted by Mr. Otto in the successful cultivation of the *Victoria regia* in the Hamburg Botanic Garden, accompanied by observations on the plant's growth. The quickest development he observed in the case of the fifteenth leaf, from the 19th to the 20th of August, which increased about nine inches in twenty-four hours, and from the 20th to the 21st of the same month, when it increased eleven inches in twenty-four hours. The leaf-stalks only extend after the leaves are nearly full grown. After giving a full detail of the progress of the plant, and the development of flowers and fruit, Mr. Otto enumerated many other exotic aquatics which he had successfully cultivated in the same aquarium.

3. 'On the Structure and Reproduction of *Volvox Globator*;' by John Sibbald, Esq. After giving a general description of this organism, the author proceeded to give a history of the opinions

and observations which have been published concerning it. He alluded especially to the accounts given by Leuwenhoek, Baker, and Ehrenberg, and next noticed the discussions concerning its nature which have been carried on by Siebold and Eckhard. But what was more particularly the subject of the paper, was the Memoir lately published by Professor Williamson, of Manchester. According to the observations of this observer, the Volvox is a confervaceous plant, and the animalcules described by Ehrenberg are merely the endochromes of the several cells, reduced to a small bulk by the secretion (between the outer cell walls and the internal cell membrane) of a hyaline substance. The cilia described by Ehrenberg, as belonging to the individual animalcules are, according to Mr. W., really attached to the external covering of the organism. Mr. Williamson also proposes the theory that the production of the young Volvoces, consists more of a process of growth than reproduction, and refers the true reproductive functions to certain bright granules, which are contained imbedded in the endochrome of each cell, these being the spores of the plant. Mr. S. stated, that though in the main, the observations of Mr. Williamson appeared to him to be correct, and that many of his deductions appeared legitimate, still there were some points in the Memoir with which he could not agree. With regard to the parts from which the cilia are developed, Mr. S. thinks that the various facts concerning them with which we are acquainted, rather lead us to the belief that they are really developed from and properly belong to the cell membranes immediately enclosing the endochromes of the cells. Next, as regards the organs of reproduction or spores, he could not agree with Mr. Williamson in thinking that the bright granules were the spores; he thought it seemed much more likely, and that it was borne out by analogy, to suppose that the whole masses of endochrome were the spores; and this, he said, seemed more probable if we regard the cilia as being attached thereto. The author next entered into the question as to the animal or vegetable character of the Volvox; and after examining the arguments which might be brought forward to support either theory, he came to the conclusion that the organism should, without hesitation, be referred to the vegetable kingdom. The communication was illustrated with very beautiful diagrams, kindly supplied by Professor Balfour.

The reading of Mr. Sibbald's paper gave rise to a short discussion, in which Professor Balfour and Mr. Wyville Thomson took part.

4. 'On the Development of the Sporidia and Spores of *Lecanora tartarea*;' by Wyville T. C. Thomson, Esq. The author gave a

sketch of the structure of lichens in general, and of their mode of nutrition and reproduction. He commenced by giving a definition of the terms used. He considered spores as being the ultimate germinating cellules, the product of the division of the compound granular cell which is the result of the union of the conjugating cells in cryptogamic plants; sporidia as the compound granular cells, the product of the union of conjugating cells; proto-sporidia as the simple cells of lichens in which the two conjugating cells are afterwards formed; gonidia as free cellules derived from and part of the cellular tissue of the parent plant, capable of continuing to a certain extent their development when free from the parent, without the intervention of the true generative act of conjugation (the analogues of free buds or bulbils in Phanerogameæ). Mr. Thomson also considered the pro-embryo in ferns and other cryptogams as the cellular expansion formed by the development of the gonidium, and containing the conjugating cells. This pro-embryo, then, corresponds to the ordinary cellular expansion of lichens.

The author then examined the structure of *Lecanora tartarea*, a crustaceous lichen holding a middle place between the foliaceous and the pulverulent species: — “When we examine a section of the frond of *Lecanora tartarea*, we meet, in the layer which immediately adheres to the rock or bark, chosen for its place of growth, with a mass of elongated, more or less filiform cells. Most of these cells are empty; some of them contain a slightly viscid fluid, and in a few there appears to be an undeveloped nucleus; the cells are delicate and of a light gray colour. Resting immediately above these, and sometimes struggling down among them, are groups of rounded cells filled with bright coloured chlorophyll, not usually arranged in a continuous layer, but scattered in small irregular patches, or as isolated cells among the gray tissue. Above the green cells we meet with another layer of transparent tissue, closely resembling that below it. In *Lecanora*, we have above all a layer of somewhat flatter cells, forming an imperfect epidermal covering. The green tissue appears to represent the living and actively vegetating part of the lichen, determining by its development the form of the frond, and giving origin to all the other tissues. The cells appear to be in some degree independent of one another, though showing an evident tendency to form small aggregations. The gray tissue packs them in, and surrounds them, but appears to undergo no further change in development. It has powerful hygrometric properties, absorbing water rapidly, and thereby undergoing great change of form. This tissue is replaced in

many lichens by an unorganized colloid matter, also hygrometric to a great degree. It is sometimes nearly absent; and, under whatever form it appears, it seems to act mechanically only, transmitting pabulum to the green layer, and keeping it surrounded by a sufficient quantity of moisture. The green cells termed gonidia frequently accumulate in masses, burst through the cuticular layer, and appear as a green powder on the surface of the plant. In this state the single gonidia are capable of continuing the powers of cell-development at a distance from the parent, forming round themselves the gray hygrometric tissue, and, like the parent plant, producing at length true reproductive organs. This is by no means a solitary instance of the formation of these from developing cells in the vegetable kingdom. We have in the ferns an instance of another order propagating through gonidia. In the ferns, cells, long called spores, are found within modified leaves, or parts of leaves. These cells, when placed in favourable circumstances of heat and moisture, develop, by nuclear division, a small cellular expansion (still part of the parent-plant, as no process of cell-conjugation has intervened), called the pro-embryo. On this pro-embryo two cellules, of different character, appear, a union takes place between the different cells, and the product is an ovoid body, the sporidium. Within this sporidium, by nuclear division, spores are produced, only one of which comes to perfection, the others proving abortive. The spore is developed *in situ*, feeding upon the pro-embryo as upon a cotyledon, and forming the new fern. To return to the lichens: if we examine sections made through the frond of *Lecanora*, through the apothecia at various stages of growth, we meet, at an early stage, with a hollow sphere of delicate, rounded cells (perithecium), surrounding a number of elongated, filiform cells (paraphyses), arranged vertically in a rounded mass. Advancing a little further in development, the cells of the perithecium above the centre of the mass of paraphyses has given way; and among the paraphyses a few flask-shaped, delicate cells (asci) are visible, closely resembling paraphyses distended and filled with mucus or cytoblastema. Very shortly the fluid contents become slightly granulated; and the granules eventually aggregate into eight cytoblasts. Round these cytoblasts delicate, rounded cells are formed, which take at length an ovoid form; and we may generally easily perceive within them two free nuclei. Round these nuclei two secondary cells are developed, which gradually increase in size, so as nearly to fill up the parent-cell. They become filled with densely-granular chlorophyll; and finally the two cells conjugate; that is to say, the walls of both cells give way,

and the granular contents amalgamate, nearly filling up the parent-cell. The result of this conjugation is a large, compound, granular cell. Watching its further progress, we observe the granules becoming more and more distinct and defined, till at length the mother-cell bursts, and the contained cellules escape; at the same time the ascus gives way, and the cellules are dispersed as spores, to originate new individuals." The paper was concluded by some general remarks on the conjugation of cells, as being in all orders of plants the type of the generative act.

Dr. Balfour stated that Mr. Allan B. Dick (assistant to Dr. George Wilson) had analyzed the leaf of *Livistonia chinensis*, *Sabal umbraculifera*, *Chamærops humilis* and *arborescens*, grown in the Palm House of the Royal Botanic Garden, and had detected a very notable quantity of manganese in their composition. He exhibited, on a platina wire, an opaque, bluish green bead, the result of fusing the ashes with carbonate of soda in the outer flame, so as to produce manganate of soda (soda mineral chameleon); and a transparent violet bead, obtained by heating the ashes with borax and a trace of nitre, so as to produce a glass, coloured like the amethyst, by oxide of manganese. Mr. Dick is now making a complete analysis of the ashes.

Mr. M'Nab read the following report on the state of vegetation in the Edinburgh Botanic Garden, from the 8th of January till the 11th of February. The communication embraced a register of the periods of flowering of plants in the open air, as compared with the flowering of the same species, and as nearly as possible the same individual plants, during the two previous years.

Name.	Dates of Flowering.		
	1852.	1851.	1850.
	Jan.	Jan.	Dec.
<i>Rhododendron atrovirens</i> - - -	14	2	
<i>Garrya elliptica</i> - - -	20	14	24
		Feb.	
<i>Rhododendron Nobleanum</i> - - -	23	2	
		Jan.	March.
<i>Geum pyrenaicum</i> - - -	23	20	22
<i>Erica herbacea</i> - - -	24	16	Feb.
<i>Corylus Avellana</i> - - -	25	16	16
<i>Azara dentata</i> - - -	26		
<i>Alnus glutinosa</i> - - -	27	13	
<i>Galanthus nivalis</i> - - -	28	17	11
<i>Knappia agrostidea</i> - - -	31	28	22
<i>Daphne Mezereon</i> - - -	31	28	22
<i>Eranthis hyemalis</i> - - -	31	15	14

Name.	Dates of Flowering.		
	1852. Feb.	1851. Feb.	1850. Jan. March.
Cornus mascula - - - -	2	14	
Symphytum caucasicum - -	2	23	14 Feb.
Galanthus plicatus - - - -	3	28	14
Crocus susianus - - - -	3	26	16 March.
Helleborus lividus - - - -	3	11	19
Sisyrinchium grandiflorum -	3	27	12 Feb.
Potentilla Fragariastrum - -	5	26	5
Helleborus odorus - - - -	10	20	14

Mr. M'Nab also presented, from Mr. Handasyde, the following list of plants observed in flower at Glen Nurseries, Musselburgh, on the 12th of February, 1852:—

Helleborus atropurpureus	Crocus, cloth of gold
„ olympicus albus	„ large yellow
„ „ ruber	Narcissus Jonquilla campenelle
„ orientalis	Primula, double white
„ Abchasia	„ „ crimson
„ viridis	Erica herbacea
„ niger	„ carnea
Saxifraga oppositifolia major	„ mediterranea hibernica nana
„ „ alba	Russian violet
Sisyrinchium grandiflorum	Rhododendron dauricum atrovirens
Leucojum vernum	Garrya elliptica has been in flower all the
Colchicum vernum	winter
Scilla præcox	

Mr. M'Nab also laid before the meeting a report of temperatures observed at the Botanic Garden from the 8th of January to the 11th of February, 1852.

Mr. M'Nab read the following extract from a letter from Dr. G. M'Nab, Kingston, Jamaica, dated the 13th of January, 1852:—“ With reference to your inquiries regarding the paper made from the Spanish dagger-plant, exhibited at the Botanical Society, by Mr. Sawers, on the 13th of November last, I have to state that the Spanish dagger is the *Yucca aloefolia*, a plant very common in this country for making fences. The fine paper-looking substance is got by breaking the lower part of the leaf along the midrib, then pulling each half gently from the cuticle which covers the upper surface. It is most easily got from the young leaves, as in them only it separates freely; it can also be

got equally well from the young leaves of the *Yucca gloriosa*. It is an excellent article for making artificial flowers, as it takes colours freely."

Mr. M'Nab exhibited specimens of the paper which he had prepared from the upper surface of the *young* leaves of *Yucca gloriosa* growing in the Botanic Garden, and he showed the method in which it was prepared.

A communication was read from Mr. William Keddle, of Glasgow, in which he stated that he had found vast profusion of *Batrachospermum vagum* in the pools and rivulets immediately under the upper part of Goatfell, in Arran, about the place where the granite comes into contact with the schistose rocks. The plant is not commonly found in Scotland. Several specimens were presented to the herbarium.

The following new members were elected :—Joseph Johnston, Esq.; T. Roxburgh Polwhele, Esq.

A Letter, addressed to Robert Brown, Esq., P.L.S., containing Botanical Memoranda of a Visit to France, in the Summer of 1851.
By JOSEPH WOODS, Esq., F.L.S., &c.*

MY DEAR MR. BROWN,—You encouraged me to think that a few botanical notes of a short tour in France might not be uninteresting to the Linnean Society. You have exposed yourself to the danger of receiving a very dull, gossiping letter; but I will do what I can.

It is quite unnecessary to make any comments on the botany between London and Paris. The route by Rouen is in this respect, as in most others, by far the most interesting. The Seine runs through a wide valley, with a rather steep slope on both sides. Descending ridges of hills start, sometimes on one side, sometimes on the other, forcing the river into a very sinuous course; and, as it approaches the main slopes, it often cuts off the shorter spurs, and exhibits perpendicular points of chalk. One of the places in which this structure of the country is best seen is at the Little Andelys; and there you have beautiful scenery, the magnificent ruin of Chateau Gaillard, built by our Richard the First, and a very varied botany. The nearly level country at the top of the hills is clayey; the slopes are chalk, and the alluvium at the bottom, which accompanies the river, is sand, a variety of soil affording a corresponding variety in its productions. The dis-

* Read before the Linnean Society, December 24, 1851—March 16, 1852.

trict is rich in Orchideæ. This seems also to be the northern point of several plants not uncommon in the south, such as *Biscutella saxatilis*, *Arabis arenosa*, *Ononis Natrix*, *O. Columnæ*, *Seseli coloratum*, *Chondrilla juncea*, *Inula britannica*, *Centranthus lanatus*, *Teucrium montanum*, *Euphorbia Gerardi*, and *Anthericum ramosum*. *Sesleria cærulea* is abundant here, and on other chalk-hills in Normandy; a rather curious anomaly, since, though plentiful on the limestone hills of Yorkshire, it does not occur in the chalk districts of Kent and Sussex. Mons. Cosson tells me of *Astragalus monspeliensis*; but this I did not see. He also finds, in some boggy ground at a little distance, several plants which seem to attain here their southern limits, at least in France. I need hardly add that the English botanist will be gratified by finding many of the rarities of his own country.

It would be as superfluous to describe the botany of Fontainebleau as that of the road to Paris; only I may notice that the English botanist is surprised to find on the loose sandy soil plants which with us are confined to the calcareous districts, as *Asperula cynanchica*, *Phyteuma orbiculare*, and especially *Orchis hircina* and *ustulata*, and *Aceras anthropophora*.

My next point of interest was the Sologne, a sandy, barren tract, which extends for a considerable distance on the south side of the Loire. I first made an excursion into it with M. Jullien, taking the railroad to La Ferté. We had proposed to reach some boggy ground at Massis, but found it too far. The most prevalent plant here is the *Erica scoparia*; and on the drier grounds an *Astrocarpus* is very abundant, which M. Jullien assures me has been pronounced by M. Godron to be *Reseda purpurascens* of Linnæus. He has named it *A. Clusii*; but there does not seem to be sufficient reason for altering the specific name, since the general effect of the plant is a somewhat purplish tinge. The stamens are more numerous than in the true *A. sesamoides*, and the filaments are rough; but I do not find the characters pointed out by M. Godron in the calyx and the form of the fruit to be constant. The banks and the corn-fields show abundance of *Anthemis mixta*. In considering the geographical distribution of plants, it seems necessary to distinguish the localities where any species is plentiful and where it may be expected whenever we meet with circumstances favourable to its growth, and those outliers, sometimes at a considerable distance, where it occurs only as a rarity. *Erica scoparia*, *Astrocarpus purpurascens*, and *Anthemis mixta* are here district plants. *Lobelia urens* was also in tolerable quantity; and this is perhaps nearly the eastern limit of these four species, in

this latitude, as characteristic plants of a district. In returning we met many of the plants loving a wet situation, and among them *Ostericum palustre* and *Aira uliginosa*.

The next morning I crossed the Sologne, by railroad to Vierzon. In point of beauty the scenery is better than that between Etampes and Orleans; the ground is more varied, and there is more wood; but, *as Sologne*, it did not appear to me so well characterized as in a short excursion I had formerly made into it, between Blois and Romorantin. As far as is visible from the railroad, *Erica scoparia* disappears before leaving the Sologne; and I met with none of it in two rambles from Vierzon, where the nature of the soil seems to be the same. *Anthemis mixta* and the *Astrocarpus* still showed themselves, but in small quantities. *Asphodelus albus* grows in the forest of Vierzon. This is also said to occur in the forest of Orleans, which is probably quite, or nearly, its northern limit. West of Vierzon a little water, oozing from below the crest of a hill, supports a few bog-plants, and among them *Spiranthes æstivalis*; but in general the soil is a very dry and hungry sand or gravel.

After leaving Vierzon, from thence to Bourges, Nevers, Moulins, and almost to Clermont, the eye only catches an occasional glimpse of any plant not English. There are, however, three species very rare in England which obtrude themselves everywhere—*Eryngium campestre*, *Verbascum pulverulentum*, and *Euphorbia Cyparissias*. The scenery, for the greater part of the way, is not more interesting than the botany; but there is one more plant which deserves mention. I first observed *Cuscuta Trifolii* near Bourges, but in small quantity, on lucerne; afterwards, from the diligence, from Nevers to Moulins, and from Moulins to Varennes, I noticed it laying waste, to a great extent, the fields of lucerne and clover. On descending into the fertile valley of the Limogne it disappeared; and between that and Clermont I saw only two or three small patches of it; but M. LeCoq assures me that he sometimes meets with it in the Limogne.

During all this route the woods are few and of small extent; broken banks none; and we pass no points which excite the imagination of the botanist, and make him long to examine them.

Clermont, as everybody knows, is among the volcanic soils of Auvergne. There are, however, beds of limestone; and these afford the best botany of the neighbourhood. *Xeranthemum cylindricum* here makes its appearance, and *Phænopus vimineus* and a few other plants of the south. *Avena tenuis* is very abundant, and is probably the best example in the district of a plant generally very rare growing plenti-

fully. *Asplenium septentrionale* is also common, growing, as usual, on the hottest and driest rocks. I mention this, because it is considered by many botanists as a northern and a moisture-loving plant.

From Clermont I made an excursion to the Mont Dore; and here we meet with a very different vegetation, exhibiting a good deal of Alpine, or perhaps rather of Pyrenean, botany, with some peculiarities. The baths of Mont Dore form a village of hotels, or rather of boarding-houses, in a narrow valley 3400 feet above the sea. This valley continues tolerably open for some distance above the village, when it terminates abruptly in two ravines, containing the streams of the Dor and the Dogne, whose united waters form the Dordogne. Turning to the right, however, we find a deeper but shorter hollow, called Vallée d'Enfer, the wildest and most savage mountain-recess I have ever seen; and the peaks above it furnish it with a supply of snow which, I believe, never disappears. The day I was there a continued rain impeded my examination of its botanical treasures; and the wet weather I afterwards experienced at the Mont Dore prevented me from revisiting it. The woods about Mont Dore are chiefly beech and *Pinus pectinata*. No other species of *Pinus* occurs here; and, according to the testimony of my guide, this never bears fruit. M. LeCoq does not admit this imputation. I can only say that I saw no cones, either on the trees or on the ground, or in the village among the collections of fuel. In my return, by the shorter road to Clermont, I often had to look down on extensive woods, and noticed, what I had seen less conspicuously in my walks, that the horizontal branches of the fir have occasionally upon them what looks like a little complete fir-tree, as if the scales of a cone had been expanded into leaves and branches. The woods in the immediate neighbourhood of the Mont Dore are rich in *Stellaria nemorum*, *Geranium phæum* and *sylvaticum*, *Rosa rubrifolia*, *Sedum villosum*, *Ribes petraeum*, *Chærophyllum aureum*, *Sambucus racemosus*, *Valeriana tripteris*, *Crepis blattarioides* and *palustris*, *Mulgedium alpinum* and *Plumieri*, *Arnica montana*, *Doronicum austriacum*, *Senecio Cacaliaster*, *Adenostyles albifrons*, *Melampyrum sylvaticum*, *Maianthemum bifolium*, *Scilla Lilio-hyacinthus*, *Luzula nivea*, *Festuca sylvatica*, and *Polypodium Phegopteris*. A *Biscutella*, considered here as *B. coronopifolia*, grows both here and near Clermont; but I doubt if it be the plant of Mont Ventoux. *Braya pinnatifida* also occurs; but this is better found on the Pic de Sauci. In the open spaces, and in the pastures, we find *Sisymbrium bursifolium* (only in one wet spot), *Viola sudetica*, *Trifolium spadiceum* and *alpinum*, *Alchemilla alpina*, *Meum*

athamanticum, *Angelica pyrenaica*, *Knautia integrifolia*, *Senecio artemisiifolius*, *Cirsium Erisithales*, *Centaurea montana*, *Campanula linifolia* (*Lam.*), *Gentiana lutea*, and *Rumex alpinus*. The Vallée d'Enfer yields *Ranunculus aconitifolius*, *Dianthus cæsius*, *Silene rupestris*, *Cerastium latifolium*, *Geum montanum*, *Potentilla aurea*, *Epilobium alsinifolium*, *Sedum atratum*, *Saxifraga aizoon*, *S. hypnoides*? with small greenish flowers, *S. stellaris*, *Imperatoria Ostruthium*, *Jasione humilis*, *Phyteuma hemisphæricum*, *Vaccinium uliginosum*, *Rumex montanus*, *Luzula glabrata* and *spicata*, *Avena sedenensis*, *Poa laxa*, and *Polypodium Dryopteris*. On the Pic de Sauci, which I ascended on a very fine day, I added *Anemone alpina* (in the typical form) and the var. *sulphurea*, *Ranunculus platanifolius*, *Trollius europæus*, *Astrocarpus sesamoides*, *Saxifraga bryoides*, *Senecio Doronicum*, *Androsace carnea*, *Empetrum nigrum*, *Salix arenaria*, which is probably the *Lapponum* of Linnæus, *Eriophorum vaginatum*, and *Teucrium spadiceum*, which latter forms the chief part of the herbage near the summit. *Polygala depressa* occurs on a granitic district below the village; and *Dianthus Seguieri* was brought me by M. LeCoq, from some sandstone hills in the same direction. We also noticed, on the road-side, *Dianthus monspessulanus* and *Agrimonia odorata*. On the way back to Clermont, by the shorter road, I observed *Cytisus purgans*, *Trifolium montanum*, *Athamanta cretensis*, *Laserpitium latifolium*, *Campanula persicifolia*, *Lilium Martagon*, and *Phleum Boehmeri*.

Before leaving Mont Dore I will mention the places in the neighbourhood pointed out to me by M. LeCoq as worthy of particular attention from a botanist. These are the Vallée d'Enfer, the Pic de Sauci, and the fir-woods *des Capucins*. These woods are close to the village on the opposite side of the Dordogne, and furnished the first part of my list. There are three other localities, which are further off, and which I did not visit. The first is the upper part of the Valley of Chaude Four. Here the waters descend eastward, towards Issoire. This upper part lies just below the Pic de Ferrand, a process from the Pic de Sauci, and offers an inviting variety of rock, wood, and sunny bank; but I apprehend that it is only on the Pic de Sauci, and in the deep hollow below, called the Vallée d'Enfer, that we meet with anything like an Alpine vegetation. The others are the woods of the Roche Sanadoire and the Marais de la Croix Morant.

I have said that I returned by the shorter road. The first part of the way is romantic; but afterwards the volcanic cones and barren sands are anything but beautiful. The approach to Clermont, again,

is very fine; but that part is common to both roads. I had completely wet days, both for going and returning.

There is a good deal of limestone near Clermont, chiefly on the eastern border of the volcanic district. Here we find many plants of the South of France; but for a person who intends proceeding southward, it is perhaps hardly worth while to lengthen his stay at Clermont, to get these plants of the limestone districts.

On the 1st of August I set off for St. Flour, at ten o'clock in the morning; but we did not arrive there till half-past one on the following morning, though the distance is only sixty-four miles. From Clermont to Lempde we meet with no considerable hill; but from Lempde we have a long and tiresome ascent on to the plateau which occupies a large portion of this district. The most remarkable plant, as seen from the coach-window, is *Genista purgans*. I thought I recollected to have seen at St. Flour my *Crucianella suffulta*, though it was not till I arrived at Le Puy that it forced itself on my more settled attention. However, I saw on this occasion nothing of it. The inn was dirty and disagreeable (it is one of the evils of night stoppages that you are almost obliged to sleep where the diligence brings you), the country by no means pleasant, and the weather unfavourable; and I was glad to get away. Finding no chance of proceeding by the mail, I resumed my place in the diligence, at half-past two in the morning of the 3rd, and reached Florac at half-past ten at night; twenty hours for a distance of not ninety miles; but the hills are tremendous. The roads, however, are excellent, and we are surprised to see them conducted on such a magnificent scale in places where the traffic is so trifling; without them, however, this district would be all but inaccessible. We descend at Marvejols into a deep, narrow, arid valley; but limestone appears near the bottom, and offers some tempting spots for the botanist. *Lavandula vera* is abundant; I noticed also *Teucrium Polium*, *Echinops Ritro*, and several other south-country plants. At Mende we again descend. Here the limestone forms great part of the hills; and we leave the place by a magnificent though rather naked gorge. At Florac the soil is schistose, and we are in the country of vines and mulberry-trees. Limestone now forms the tops of the hills, instead of lying at the bottom as at Marvejols, and is much less productive botanically. The environs of Florac are, however, neither unpleasant nor unproductive. In the neighbourhood of an old bridge above the town, near which the road to Nismes passes, I gathered *Dianthus virgineus*, *Silene Saxifraga*? (the thecaphore is not half as long as the capsule), *Potentilla*

rupestris, *Sedum maximum*, *S. altissimum*, *S. dasyphyllum*, and *S. amplexicaule*, *Bupleurum junceum*, *Crucianella angustifolia*, *Senecio artemisiifolia*, *Antirrhinum Asarina*, *Anarrhinum bellidifolium*, *Erinus alpinus*, *Plantago Cynops*, *P. alpina*, and *P. serpentina*, *Rumex scutatus*, *Andropogon Ischæum*, *Psilurus aristatus*, and *Triticum Poa*. In other parts of my walk I observed *Lathyrus latifolius*, *Lavandula vera*, *Salvia Sclarea*, *Teucrium Polium*, and *Salix incana*. The lower hills are a good deal covered with chestnut-trees; and the ground among them is very dry and barren. Above these is often a tract not without moisture, and cultivated. Again higher up we find limestone, with scrubby beeches and an undergrowth of box.

About ten o'clock at night the diligence again took me up; and the moonlight enabled me to see that we ascended among groves of chestnuts to the plateau, dipping occasionally into deep, narrow valleys, till, in the deepest of them, we reached St. Jean du Gard. The descent is on schistose rocks; at the bottom we meet with granite; then limestone occurs in the valley; and we here leave the elevated plateau. A decomposing granite next appears, and afterwards, at Anduze, lofty limestone rocks, with the strata very much contorted. All this variety promises well for botany; but after my night's journey I was too sleepy to be very observant from the windows of the diligence. At Anduze we leave the hills and the more solid rock; but the country from thence to Nismes is composed of beds of limestone alternating with clay, apparently very barren, but rich in the botany of the South. At this time of year the prickly plants were very abundant—*Scolymus hispanicus*, *Cirsium ferox*, *Picnomon Acarna*, *Echinops Ritro*, *Onopordon illyricum*, *Carlina corymbosa*, &c.; but we have also *Clematis Flammula*, *Paliurus aculeatus*, *Sedum rupestre*, *Bupleurum rigidum*, *Scabiosa ambigua*, *Santolina Chamæcyparissias*, *Helichrysum angustifolium*, *Catananche cærulea*, *Microlonchus salmanticus*, *Centaurea paniculata*, *C. collina*, *C. napifolia*, *C. pectinata*, *Inula salicina*, *Tanacetum annuum*, *Verbascum sinuatum*, *Satureja montana*, *Quercus Ilex* and *coccifera*, and *Asparagus acutifolius*. This exhibition excited so much interest, that I returned afterwards from Montpellier to revisit the place; but I found that I had miscalculated my distances, and had not allowed myself time to reach the locality where I had chiefly remarked them.

From Montpellier I went to Cette, by railroad. Cette is at once the seaport and the bathing-place of Montpellier. It stands at the foot of a limestone hill, rising from the long strip of sand-hills which separates a succession of brackish pools (or *étangs*, as they are here

called) from the sea. The place was so full that I could only get very poor accommodation, and, after a walk in the evening on the shore of the Etang de Thau, set off the next morning to Agde. That walk furnished me with *Ambrosia maritima*, to which I had been directed by Mons. Dunal, supposed to have been introduced, by some accident, from Italy; and a more remarkable foreigner—*Heliotropium curassavicum*, a native of the West Indies. The pool is navigable for small steamers; but I believe large ships cannot enter it; and how these plants should have fixed themselves there is very problematical.

On the 10th I went to Agde. A steamer carries us along the pool to the opening of the canal. The first part of the voyage is very pleasant, the hill at Cette and the limestone hills opposite to it forming good objects. Afterwards the scenery gets more tame; and we were transferred to a smaller boat, drawn by horses, to proceed along the canal to Agde. This part is very uninteresting; and for the beauty of Agde, or of the country about it, there is not much to be said. The soil is volcanic; but there are some pools, or rather puddles, which are celebrated for their curious plants. Mons. Fabre conducted me to some of these, but they contained no water; and the *Charas*, *Marsilea pubescens*, *Isoetes setacea*, *Lythrum hyssopifolium*, *Ranunculus lateriflorus*, and a new *Elatine* (or perhaps *E. macropoda*) were altogether dried up. We gathered in them *Mentha cervina* and *Heliotropium supinum*, and observed in the neighbourhood a *Polygonum* with a woody base, which is, I think, the flagellare of the Roman botanists; but M. Fabre told me he had watched it for several years, and that it had never flowered. There was also *Croton tinctorium*, and a *Helminthia* very different in its general habit from *H. echiioides*; and, whether species or variety, it is, I believe, the *H. humifusa* of Gussone. *Echium pyrenaicum* is exceedingly abundant, and, more rarely, *Carlina lanata*. In a solitary walk I gathered *Jasminum fruticans* and some other warm-country plants; but on the whole the general botany is much less interesting than that of Nîmes or Cette. I afterwards went, with M. Fabre, to the mouth of the Herault. On the way we got *Ammi Visnaga* and *Suaeda setigera*; and I observed *Salicornia fruticosa* and *Suaeda fruticosa* far above any common access of sea-water. The places might be overflowed in winter, but rather, I should think, with the fresh-water brought down by the Herault than with salt. On the sand-hills of the Herault are several plants not often found further north—*Anacyclus radiatus*, *Psoralea bituminosa*, a *Dorycnium* (which is here considered as *D. herbaceum*; but, as the pods are one-seeded, it would seem not to be

the plant of DeCandolle), *Echinophora spinosa*, and *Rumex tingitanus*. In the wetter parts were *Linum maritimum*, *Sonchus maritimus*, and *Plantago Cornuti*, *Salicornia fruticosa* in flower, another (*Arthrocnemum* of Moquin) in fruit, another *Salicornia* only just in flower, which is perhaps *radicans*, and a form of herbacea hardly yet in flower. What I here suppose to be *S. radicans* differs from ours in the greater permanence of its creeping rhizoma, and it is less branched; but it was not far enough advanced to enable me to understand the structure of its seed. The *S. herbacea* is in the form which it exclusively assumes in the South of France, both on the Mediterranean and Atlantic. It differs from ours in the more taper spikes, and the length and abundant ramification of its lower branches. I should say it was between the form which I have on a former occasion called *S. ramosissima* and *S. procumbens*. It is not confined to the south, for I have a specimen from the banks of the Scheldt, which evidently belongs to the same variety. *Salicornia fruticosa* I could not find on the Bay of Biscay; but here and at Cette what I imagine to be the true plant was only just coming into flower. One of the remarkable plants here is a *Spartina* discovered by M. Fabre, who was puzzled by it for some years, as he did not visit the place in December, which is the period of its flowering. Mons. Dunal has described it under the name of *Spartina versicolor*; but I am assured by M. Gay that it is the *Spartina juncea* of Willdenow, a plant of the southern parts of North America. He assures me also that it has been found in one or two other places on the shores of the Mediterranean. Its position here has no appearance of a foreign origin, for it is not near the navigable entrance of the river, but on the inner, depressed part of an extensive range of sand-hills, and on the margin of a piece of water which seems to have no permanent connexion with the sea. Mons. Fabre's attention to it originated in the occupation of a piece of land in the neighbourhood, which he now cultivates with madder, a very profitable crop in the South of France. Mons. Fabre has been carefully cultivating for some years the species of *Ægilops*, and thinks he has proved that *Æ. ovata* and *Æ. triuncialis* may both become *Æ. triaristata*. He even goes further, and contends that all three may be converted into *Triticum sativum*.

I walked back to Agde, and the next day returned to Cette, where the inn was not so full as it had been; and I got an excellent room, paying for my whole expenses five francs a day. Cette is seated on the eastern base of a rocky limestone hill, which is entirely insulated, except by the long, low, sandy tract which here borders the Mediterra-

nean, and separates it, as I have already said, from a series of brackish lakes, called *étangs*. A broad canal unites the lake with the port ; and the water in this canal does not always run the same way.

I have already anticipated some plants on the borders of the pool ; others interesting to a northern botanist are *Suæda hirsuta* and *S. setigera*. In drier places we find *Xanthium Strumarium* and *X. spinosum* in great abundance, as also *Momordica Elaterium*. On the hill *Mercurialis tomentosa* deserves our attention, and still more *Lactuca tenerrima*, two plants of very limited geographical position. We find *Evax pygmæa*, *Carlina corymbosa*, *Plantago Lagopus*, and several other plants more common in Italy, and, in some hedges dividing the little pieces of land which have been redeemed from the sand-hills, *Cynanchum acutum*. *Crucianella maritima* is abundant on the sands ; and here also grows *Ephedra distachya*, a plant I had before met with at Port Louis, on the shores of the Atlantic, but which I did not meet with at Bayonne or Biarritz, and which does not occur in the 'Flore Bordelaise' of Laterrade. According to Duby it is found on the shores of France from Nice to Nantes ; but I apprehend this is only at very wide intervals. It has no place in the Roman flora, but we meet with it again in the Neapolitan. It does not reach, apparently, the shores of the Adriatic ; but Koch mentions it in the Vallais and the Southern Tyrol. *Phlomis Herba-venti* occurs both here and at Nismes ; by no means a common plant of the South. *P. Lychnitis* and *Sideritis romana* are more common. *Erythræa spicata* occurs on the sands. The *Salicornias* at Cette are like those near Agde. The *Statice*s also are nearly alike in both places. We find at Agde a variety of *S. Limonium* in which the lower secondary branches are uniformly barren. At Bayonne, as with us, there are hardly any barren branches. The *Statice*s at Cette are chiefly on the limestone rock ; at Agde, on the sand. *S. oleifolia* and *S. psiloclada* are abundant in both places. *S. echioides* is scattered here and there about Cette. *S. auriculifolia* and *S. caspia* are more abundant about the mouth of the Herault. A new *Statice* is said to have been discovered on the *Place d'Agde* ; and, imagining it to be some square half surrounded by houses, I supposed that I should soon be there, and that I should have but a small space to examine. The answer to my inquiries from those who knew anything about it, was always that I must go further ; and at last, having left not only the town, but the hill on which it is placed, I found that the *Place d'Agde* was the strip of sand, about ten miles long, extending to the neighbourhood of Agde. It probably should be *Plage d'Agde*. At the mouth of the

Herauld I gathered a *Statice* much like *S. oleifolia*, but without barren branches ; I do not know if this was the one in question. I was surprised that I did not in either place find any of the tribe of *S. pubescens*, which is so plentiful towards Nice, nor *S. ferulacea* and *monopetala*, which are so characteristic in the Isle of Ste. Lucia, near Narbonne. I had rather hoped, from my intermediate position, that I should have found both these plants near Cette. The *Artemisia* of the South of France, whether on the Mediterranean or on the Bay of Biscay, which occupies the place of our *maritima*, is uniformly the *A. gallica* ; and on observing the entire want of variations in a plant occurring so extensively, we cannot be surprised that the French have exalted it into the rank of a species.

From Cette I returned to Montpellier, and walked down to the Port Juvenal, a place where wool from Barbary and the Levant has been of old spread out on its arrival. Several rare plants have, at different times, made their appearance here ; but most of them disappear in a year or two. I was, however, much interested by specimens of *Verbascum speciosissimum*, which I had gathered in the same place more than twenty years ago.

I took the mail from Montpellier to Toulouse, and the banquette of a diligence (not finding a place in the interior or in the mail) to Pau. There I was laid up for a fortnight, and could do nothing in botany ; but in fact there is at this time of year little to be done. The gravel of the Gave is not very accessible ; nor did it give me as much as I expected. *Reseda glauca* was the only good plant I there met with. *Linaria organifolia* is abundant on the old walls, and *Erica vagans* everywhere ; but the vegetation in general was much more like that of England than in the places I had lately been visiting. From Pau I went to Bayonne, whence I made an excursion to Biarritz. *Digitaria paspaliformis* is very abundant in some places near Bayonne. This plant is said to have been transported from America to the banks of the river at Bordeaux ; but, from the manner in which it is found here, I rather suspect it to be one of the plants which, plentiful in America, has a station on this side the water, like *Spiranthes cernua* and *Spartina juncea*. *Spartina alterniflora* seems to be in tolerable abundance ; but its station, overflowed by the tide, is much trodden on by cattle ; and between poaching and eating, it would have been difficult to procure a good specimen. The valley at Bayonne is pleasant, bounded by a succession of low bluffs, often woody, and sometimes surmounted by pleasant-looking villas. The Pyrenees form a good back-ground, but rather of moderately-elevated hills than of mountains.

My first walk was above the town, after an unsuccessful call on M. Darracq, who at first was at Biarritz, and afterwards on a botanical excursion towards the Spanish frontier. The first plant which excited my attention was the *Daucus Carota*, a variety with red flowers, and the umbel less radiate than usual; and what I believe to be a monstrosity of the same, with a smooth germen, and so much elongated that I imagined myself to have found a new *Chærophyllum*; but the seeds were not far enough advanced to afford satisfactory specimens. Some of the ditches in this direction are full of *Leersia oryzoides*, with a large, entirely exsert, and well-developed panicle. On the hills was *Ulex Gallii*; and I found this afterwards very abundantly at Biarritz. On the road-side between Bayonne and Bordeaux this gives way to the typical form of *U. nanus*; but on returning, at La Teste, to the shores of the ocean, I again found exclusively *U. Gallii*, of the largest size, and more nearly approaching to *U. europæus* than I had ever before seen it. I also gathered what I believe is a *Laserpitium*, but in so young a state that I cannot be confident of its genus. The best plants at Biarritz at this time of year are probably *Linaria græca* and *L. Prestrandreæ*. I do not, however, perceive much difference between the seeds of the latter and those of *L. spuria*. *Linaria thymifolia* is a common plant of the coast; and *Dianthus gallicus* is a plentiful and beautiful ornament to the sand-hills. This is the *D. arenarius* of the 'Flore Française;' but Koch will not allow it to be the plant of the shores of the Baltic, which is that of Linnæus. The chief difference seems to lie in the obovate inline of the beardless petals, which in *D. arenarius* is oblong. *Artemisia crithmifolia* is abundant on the sand-hills, both at Biarritz and at Bayonne; and I gathered also *Galium arenarium* and *Diotis candidissima*. *Statice occidentalis* was the only *Statice* I saw there. The country about Biarritz corresponds with our greensand; and the very intricate and broken rocky coast near the place promised a better botanical harvest than was realized. There are many little valleys, each with a little stream at the bottom, and a good deal of boggy ground, affording *Lythrum Græfferi* and *Scirpus littoralis* and *S. Savii*. *Lobelia urens* is common; and in drier parts *Lithospermum purpureo-cæruleum*, *Erica vagans*, *E. cinerea*, and *E. ciliaris* are frequent; but I did not see *E. Tetralix*.

On the 11th I returned to Bayonne, and, finding no probability of obtaining a place in the great diligence, engaged a place in the *concurrente*. In general these partial, rival diligences are not so convenient, nor so well mounted, as those of the great establishments; but in this case I had no reason to complain, for we reached Mont de

Marsan, a distance of sixty-two miles, in eight hours and a half, including an hour's stop at Dax, where we breakfasted. Cork-trees are abundant on the road; and *Erica scoparia* is everywhere, forming tall, upright bushes, sometimes almost as large as those of *E. arborea*.

Mont de Marsan is hardly on a hill, in spite of its name. It stands on a slightly elevated point between two little streams. The immediate neighbourhood is cultivated; but the pine-woods of the Landes surround it at a little distance. I was not well enough to explore their recesses. The inn there (Hotel des Ambassadeurs) is exceedingly comfortable. At noon on the 13th I found room in the mail for Bordeaux, to which place we proceeded at the rate of ten miles an hour; but I was again unwell, and hardly equal to calling on my old acquaintance, M. Laterrade, at the Botanic Garden. He assured me I should find *Salicornias* at La Teste; and on the 16th I went there. It is well that any English botanist who finds himself at Bordeaux should know that La Teste is a small village, entirely without interest, and that the place to be visited is at the baths, two miles further on; but he will find omnibuses to take him there from the station at La Teste. Murray, in his Hand-book, ridicules the projectors of the railway from Bordeaux to La Teste for not knowing that railroads do not form villages. I think in this case he is doubly wrong, for I believe the chief object of the railway was to enable the produce of the country to find a market in Bordeaux, which the deep sand of the natural roads rendered impossible; and I think we may see in the increased extent of cultivation and plantation that they have not been disappointed. If the bathing-place had been the main dependance of these projectors, they would not have stopped two miles short of it. In the second place, in spite of this drawback, the railway *has* made of the bathing-place a very long village, not on the open sea, but on the shores of the spacious salt-water lake of Arcachon. The scattered and often fanciful cottages, standing mostly detached, and not forming rows of lodgings, mixed with the pine-woods, and exhibited on the varied line of the shore, have often a very pleasing and picturesque effect. There is at the baths abundance of an *Atriplex*, which is certainly the *A. rosea* of Laterrade, and probably that of Duby; but it is not the plant I have collected under that name in Germany and the South-east of France, and which I believe to be the plant of Koch. It is, I think, my *A. arenaria*, but of much stronger growth, owing perhaps to a warmer climate. It has a firm, erect central stem, and numerous branches from its base, decumbent at first, but ascending in the flowering part, and as long or longer, if

straightened out, than the central stem, a mode of growth sufficiently marked and sufficiently common to deserve a peculiar name.

I was disappointed as to *Salicornias*, finding only one species, something between herbacea and procumbens, the same which I have already mentioned at Agde. The trains leave La Teste only late in the evening and early in the morning; and I returned the same day to Bayonne.

On the 18th I went to Angoulême, a town picturesquely placed on a high point of land above the river Charente, and possessing a cathedral, very interesting from its architectural peculiarities rather than from its beauty. We did not arrive till about eight in the evening; and the best inns were filled with persons connected with the works on the Bordeaux Railway; so that I was obliged to put up with one much inferior. My walk the next day was a very interesting one. Crossing the little stream on the south of the town, I ascended, by cultivated fields and woods adorning a rocky crest, to the general plateau. *Odontites Jaubertii* is in the greatest abundance, and several of the rarities of Fontainebleau and Normandy. I continued my walk to some old quarries, which seem to have furnished both mill-stones and building-stones here. *Artemisia camphorata* and *Sideritis scordoides*, var. *hyssopifolia*, were in great profusion. The former is placed with those *Artemisiæ* which have a hairy receptacle; but it is often a matter of difficulty to find the hairs, which at best are few and weak, and I believe not unfrequently quite deficient; and in the majority of plants of the latter the bracts were absolutely entire, instead of spinoso-dentate; so that both the plants puzzled me.

On the 20th I proceeded to Poitiers; and, after spending one day and half another in visiting the very interesting antiquities of that city, I put myself under the guidance of Monsieur Malapert, and had a very pleasant walk on the brow, and among the rocks and woods which border the chain, but without much botanical success. This was my last attempt. I proceeded, by the rail, to Paris, and in a few days returned to England, in time for a parting view of the Great Exhibition.—Yours truly,

JOSEPH WOODS.

Priory Crescent, Lewes, Sussex.

The 'Lancet's' Analytical Sanitary Commission. — Adulteration of Tea, &c.

SINCE these most valuable papers on the adulteration of food were noticed in the 'Phytologist,' a number of other articles in general use have been examined, and the various sophistications practised on them by dishonest traders exposed. We bring the subject forward again, chiefly for the purpose of putting our readers in possession of the facts discovered relating to that all but indispensable article of diet—*Tea*.

The subject is treated at such length in the 'Lancet,' that a complete analysis of the reports would far exceed our limits. A brief account of the results arrived at is all we aim at giving.

The adulteration of tea is an art largely practised by the Chinese, the processes employed being similar to those adopted in England. They occasionally make use of the leaves of *Camellia Sasanqua* and *Chloranthus inconspicuus* for this purpose. It has been said that the dung of silkworms is sometimes mixed up with tea; but we hope this trick is rarely performed. In tea of British fabrication leaves of the following trees have been detected:—beech, elm, horse-chestnut, plane, bastard plane, fancy oak, willow, poplar, hawthorn, and sloe. But a more ingenious fraud is also practised. It is thus described by a gentleman connected with the Excise Office in London:—"In the year 1843 there were many cases of re-dried tea-leaves, which were prosecuted with vigour by this Board, and the result was, so far as we could ascertain at the time, the suppression of the trade. It was supposed in 1843 that there were eight manufactories for the purpose of re-drying exhausted tea-leaves in London alone, and several besides in various parts of the country. The practice pursued was as follows:—Persons were employed to buy up the exhausted leaves at hotels, coffee-houses, and other places, at $2\frac{1}{2}d.$ and $3d.$ per pound. These were taken to the factories, mixed with a solution of gum, and re-dried. After this the dried leaves, if for black tea, were mixed with rose-pink and black lead, to face them, as it is termed by the trade." It is probable that this manufacture is extensively carried on at the present day. We extract the following results of three series of analyses, believing that they present us with a very clear and accurate state of the case as regards the purity of black tea.

Series I. shows:—

"1st. That not one of the thirty-five samples of black tea, as imported into this country, contained any other leaf than that of the tea-plant.

“ 2nd. That out of the above number of samples, twenty-three were genuine and twelve adulterated. The genuine teas were the Congous and Souchongs, &c., and the adulterated teas samples of scented Pekoe and scented Caper, Chulan or black gunpowder, as well as imitations of these made from tea-dust.

“ 3rd. That the adulterations detected consisted in facing (so as to improve the appearance of the teas) the surfaces of the leaves with black lead, powdered mica, indigo, and turmeric.”

Series II. shows :—

“ 1st. That the fabrication of spurious black tea is extensively carried on at the present time in the metropolis and other towns of the kingdom.

“ 2nd. That two processes of fabrication are adopted : in the first, the exhausted tea-leaves are made up with gum and re-dried ; black-lead, powdered mica, rose-pink and carbonate of lime being sometimes added to bloom or face the leaves, as well as sulphate of iron to darken their colour and to give astringency ; in the second, leaves other than those of tea (the kind matters but little) are used. These after being dried are broken down, and mixed with gum catechu made into a paste ; the leaves are then re-dried, and further broken down, and sometimes coated with gum. The spurious tea made from exhausted leaves is seldom sold alone, but is used either for mixing with genuine black, or is converted into green tea in the manner to be described hereafter ; while that made from British leaves and catechu is either mixed with black tea in the form of dust, or else is faced and bloomed until it is made to resemble green tea.”

Series III. shows :—

“ That out of twenty-four samples of black tea purchased of tea-dealers and grocers resident in the metropolis, twenty were genuine and four adulterated ; the former being Congous and Souchongs, and the latter samples of scented Pekoe and scented Caper.

“ In reference to the four adulterated samples of tea, it is right to state that not the slightest blame is attached to the dealers from whom they were purchased, they being in all probability wholly unaware of the fact of these particular descriptions of tea being adulterated or faced in the manner described. The samples were introduced in order to show that these teas do really reach the consumer in an adulterated condition.”

It thus appears that while the great bulk of the black tea used in this country—*viz.*, Congou and Souchong—are delivered to the consumer in a genuine state, the scented teas—*viz.*, the Pekoes and

Capers—are invariably adulterated. We may therefore congratulate ourselves, when sipping our infusion of Congou or Souchong, that in all probability we are imbibing a genuine article; but if *green tea* enters into the composition of our beverage the case is widely altered. Unfortunately there is too much reason to conclude that genuine green tea cannot be obtained in England at any price. Here Chinese and English rogues have found full scope for their wicked ingenuity, and have met with a success worthy of a better cause. Here, too, the fraud is more intolerable, by reason of the poisonous nature of the ingredients used. Up to a certain point the process of making artificial green tea is the same as that for black, the difference consisting in the colouring. To produce the characteristic colour of green tea three colouring matters are generally used—a yellow, a blue, and a white. The yellow and blue when mixed form a green, and white is added either to lessen the intensity of the former colours, or else to give polish to the surface of the leaves.

The following extract from ‘Household Words’ we copy as quoted in the ‘Lancet.’ It is headed “Death in the Tea-pot.”

“A short time since a friend of mine, a chemist in Manchester, was applied to for a quantity of French chalk, a species of talc, in fine powder; the party who purchased it used regularly several pounds a week; not being an article of usual sale in such quantity, our friend became curious to know to what use it could be applied; on asking the wholesale dealer who supplied him, he stated his belief that it was used in ‘facing’ tea (the last process of converting black tea into green), and that within the last month or two he had sold in Manchester upwards of a thousand pounds of it. Our friend the chemist then instituted a series of experiments, and the result proved that a great deal if not all the common green tea used in this country is coloured artificially. The very first experiment demonstrated fraud. The plan adopted was as follows:—A few spoonfuls of green tea at five shillings a pound were placed on a small sieve, and held under a gentle stream of cold water flowing from a tap for the space of four or five minutes. The tea quickly changed its colour from green to a dull yellow, and upon drying with a very gentle heat gradually assumed the appearance of ordinary black tea. On making a minute microscopic examination of the colouring matter washed from the leaf, and which was caught in a vessel below, it appeared to be composed of three substances, particles of yellow, blue, and white. The blue was proved to be Prussian blue, the yellow thought to be turmeric, and the white French chalk. If the two former be mixed together in fine

powder, they will give a green of any required shade. It is made to adhere to the tea-leaf by some adhesive matter, and then it is faced by the French chalk, to give it the pearly appearance so much liked."

The above statements are confirmed by the 'Lancet's' analyses of twenty samples of green tea, showing:—

"1st. That the whole of the twenty samples of green tea were artificially coloured, blazed, or painted, with a mixture of Prussian blue, turmeric powder, and China clay.

"2nd. That eleven out of the thirteen gunpowder teas, in addition to being artificially coloured, were adulterated with different proportions of Lie tea, this article in some cases forming the chief part, and in other instances nearly the whole of the samples.

"3rd. That out of the twenty samples not one was found possessed of the natural green colour.

"The price of Lie tea is from sixpence to eightpence per pound, exclusive of duty; it is a worthless article, and from the extent to which it is coloured with Prussian blue very injurious to health."

Reports on milk very appropriately follow those on tea. From the samples analysed it would appear that water is the only extraneous substance added. Neither chalk nor any of the other articles generally supposed to be used in the adulteration of milk were detected. Various other articles have been examined. In each case either an inferior article is sold under a false name, as gelatine for isinglass, cassia for cinnamon, or the bulk of the genuine article is increased by the addition of cheaper substances; thus a mixture of cassia and cinnamon is made, or perhaps cassia or cinnamon-powder is mixed with large quantities of arrow-root, potato-flour, sago-meal, or wheat-flour, *baked*, to give them a brown colour, the mixture in every case being sold as cinnamon, and at genuine cinnamon price. In the case of ginger the process is nearly the same—sago-meal, potato-flour, wheat-flour, ground-rice, with perhaps Cayenne pepper or mustard-husks, to give apparent strength, and turmeric-powder, to impart a yellow colour. These additions occur in various quantities; but in the majority of cases they constitute the chief bulk of the article. Cocoa also is overwhelmed with wheat-flour, potato-starch, sago-meal, &c., or mixtures of these in various proportions, the additions (varying from five to fifty per cent.) being coloured with red-ochre.

While passing over several interesting reports on various minor articles of food, we must not omit a warning against the green pickles of the shops—French beans, gherkins, &c. Their attractive green colour is due to the presence of copper. The quantity varied in

amount in different samples; but in many cases the proportion found was likely to be extremely injurious to health.

One more example, and we have done. It is not so much an adulteration as an illustration of the modern art of puffing. Every newspaper contains advertisements of articles particularly recommended to invalids, dyspeptics, and the public generally. These compounds, rejoicing in such outlandish titles as "Ervalenta," "Revalenta Arabica," &c., when stripped of the veil artfully thrown around them by impostors, are found to be nothing but French, German, or Arabian lentils, with a mixture of barley-flour or other substances. A packet of Revalenta Arabica examined was found to contain a paper headed "Cruel deception on Invalids exposed," and made up of quotations condemnatory of lentils and barley-flour. It will perhaps hardly be believed that the precious article thus puffed consisted chiefly of those denounced articles, lentils and barley-flour! "Extremes meet," the writer of the report slyly remarks. "Lentils being somewhat cheaper than peas, are supplied to many of our workhouses to be used in the preparation of soup, &c. Thus they are not only consumed by paupers, but by the rich, the chief difference being that the latter frequently pay two shillings and ninepence per pound for them."

We cannot refrain from adding our mite to the praise which has been so generally awarded to this admirable series of papers. It is evident that no time, labour, or expense has been spared to make them what they profess to be, complete and authentic exposures of so many indirect robberies practised by dishonest dealers and manufacturers; and we hope that the time will come when such nefarious transactions as those here described can be no longer carried on with impunity.

Note on Asplenium fontanum. By the REV. ANDREW BLOXAM, M.A.

I HAVE been this week to inspect the herbarium formed by the late Dr. Power, of Atherstone, now in the care of his daughter, Miss Power. The plants are fixed down in several thick folio volumes. Amongst the ferns there is one frond, in fructification, of *Asplenium fontanum*, with the following locality attached, in Dr. Power's own handwriting:—"Between Tan-y-Bwlch and Tremaddock." Miss Power, who was with her father when he gathered it, informed me that it was in Mr. Oakley's grounds. She was well aware of the rarity of this fern, and mentioned to me that she had also found it at the

Swanage Cave, near Tillavilly, Isle of Purbeck, Dorsetshire. She collected several specimens, but had given them away. I compared the specimen in the collection of the late Dr. Power with one given to me by Mr. Riley, of Papplewick; and I have no doubt of its being the true *Asplenium fontanum*. It would be well worth the attention of Dr. Bell Salter, or any other botanist in the neighbourhood of Poole, to search again for it in the latter-named locality.

ANDREW BLOXAM.

Twycross, Atherstone,
March 13, 1852.

On the Glamorganshire Locality for Cnicus tuberosus.

By T. B. FLOWER, Esq., F.L.S., &c.

IN the first volume of the 'Phytologist' a second locality was published for this very rare local species, by Mr. Westcombe, *viz.*, "Between St. Donat's and Dunraven;" and, being desirous of ascertaining whether the plant was identical with that from Great Ridge, on the Wiltshire downs, I applied to him for his opinion, when he kindly favoured me with specimens from his garden, that had been obtained from the Glamorganshire locality; and upon comparing them with those in the herbarium of Sir J. E. Smith, I found they could not be referred to *Cnicus tuberosus*, but would possibly prove to be the *C. Woodwardii* of Mr. Watson; and, having lately submitted them to that gentleman, he arrived at a similar conclusion, and writes me:—"The plant looks so unlike ordinary *C. pratensis*, that I do not wonder at the supposition of its being some other species."

T. B. FLOWER.

Seend, Melksham, Wilts,
March 11, 1852.

Note on Convallaria bifolia. By H. L. DE LA CHAUMETTE, Esq.

DURING a short stay, last September, at Hampstead, I was engaged in searching for some of the rarer plants said to be found in the vicinity. Having got admission by Mr. Cockburn to Caen Wood, he led me to a beautiful habitat of *Convallaria bifolia*, which I immediately recognized, to his surprise, for he said he thought he should have shown me something which I had not seen before, as he had

shown this habitat to several who did not recognize the plant. It was growing in patches, under the shade of fir-trees; and, as Mr. Edwards is said, at p. 675, to have stated in a former volume (*Phytol.* i. 579), it was growing in the highest part of Caen Wood, between Hampstead and Highgate. I have little doubt that the habitat that was shown to me is identically the same that Mr. Edwards must have found many years back. Having seen the *Maianthemum bifolium*, as it is more generally called abroad, growing in abundance, as well as having found large patches of *Convallaria majalis* in woods in Switzerland, I have seen them *both* in native habitats; and certainly I have not the least doubt about the patches I saw being *Maianthemum bifolium*, although, on account of the late season of the year, they were all out of bloom. It is rather a peculiar circumstance to my mind that they are growing under the shade of firs, for they almost invariably grow under the firs in Switzerland; and I think this would be in favour of their being indigenous in that locality. Indeed, from their manner of growth and this other circumstance, I very much doubt of their having been naturalized there; but of course I leave it to more able botanists to decide.

H. L. DE LA CHAUMETTE.

Church Street, Stoke Newington,
March 16, 1852.

[To some of our readers the following notes and references will be of interest:—

“It groweth in moist shedowie and grassie places of woods in many places of the Realm.”—*Parkinson, Theatr.* 505.

“Monophyllon groweth in Lancashire in Dingley wood, six miles from Preston in Aundernes; and in Harwood neere to Blackburne likewise.”—*Ger. Em.* 409.

“My friend the Rev. Osd. Head, of Howick, discovered it growing, rather sparingly, under the shade of a wide-spreading beech, in one of the woods at Howick.”—*R. Embleton in Phytol.* i. 520; also in *Ann. Nat. Hist.*

“In 1835, I detected several patches of the plant, apparently well established and really wild, under the shade of fir-trees, growing near the highest parts of Caen Wood, the property of the Earl of Mansfield, between Hampstead and Highgate. A year or two before that time, I had also observed it under fir-trees in Aspley Wood, Bedfordshire.”—*E. Edwards in Phytol.* i. 579.

See also a note by Mr. Forbes, *Ann. Nat. Hist.* 1843, p. 158;

another by Mr. Borrer, *Phytol.* i. 611; another by the same author, *Phytol.* ii. 432, which confirms the Caen-Wood but not the Howick station; and, finally, the remarks of Mr. Watson, *Cyb. Brit.* ii. 465. —*Ed.*]

PROCEEDINGS OF SOCIETIES.

Botanical Society of Edinburgh.

Thursday, March 11, 1852.—Professor Balfour, Vice-President, in the chair.

Donations were announced of Moore's 'Garden Companion and Florists' Guide,' from the editor, and of a packet of plants from Mr. Oliver, Newcastle-upon-Tyne, including beautiful specimens of *Erica Mackaiana*.

The Society presented the following specimens to the Museum of Economic Botany at the Royal Botanic Garden:—Forty sections of woods grown in Britain; collection of fifty-eight kinds of seeds and fruits, including many interesting medicinal species, presented by Dr. Christison; collection of twenty kinds of seeds and fruits, and of twenty-one varieties of woods, from the Cape of Good Hope, presented by Dr. Fraser; six pine-cones, presented by Sir W. C. Trevelyan; collection of twenty-two kinds of Barbadoes woods, presented by Alleyne Maynard, Esq.; sixteen varieties of woods used in ship-building, presented by Dr. Maclagan; specimens of *Agaricus*, *Polyporus*, and *Boletus*, collected by Dr. Wallich in India, and by Dr. Lippold in Madeira, presented by Dr. Greville; collection of Syrian seeds, presented by Professor Edward Forbes.

Dr. Balfour announced the following donations to the Museum of Economic Botany at the Botanic Garden, received since the last meeting of the Society:—1. From Sir William Jardine, Bart., Jardine Hall, two sections of an aged thorn, of which he remarks:—"In regard to the thorn, we have two very large trees here, both of which were much shaken by the great storm of the 7th of January, 1838 or 1839. The principal one being split and irretrievably damaged, we hooped it, and took other precautions; but about three years since they both fell during a very severe winter gale. It was a remarkable one, though no notice was at the time taken of it. I was sitting, either reading or

drawing, about two p.m., when the gale became so furious as to cause me to rise, and look from the lobby at what was going on ; and in one of the gusts of wind ensuing I saw our old thorn laid over. When Selby was writing his 'Forest Trees' for Van Voorst, I sent the drawing from this thorn which is there engraved (page 67) ; and you will find the dimensions printed in his history of the thorn, taken at the same time (1841 or 1842). The age of the tree there mentioned (132 years in 1842) is calculated supposing it to have been planted about the time of the building of the last mansion-house here. It may have been a few years older. It was blown over, I think, in the winter of 1839, which would make its age then about 139 years. The same tree is also that mentioned by Loudon in his 'Arboretum,' among the 'Scotch Worthies.' Height of trunk, or stem, 7 feet 8 inches ; circumference at one foot from ground, 8 feet ; at the insertion of branches, 8 feet 6 inches ; diameter of circle overspread by the branches, nearly 50 feet ; age when blown down, 139 years. 2. From Mr. Young, Newbigging, Burntisland :—Six stalks of *Andropogon saccharatus*, *Rox.* (*Sorghum saccharatum*, *Pers.*), a kind of millet, grown in Mr. Young's garden, at Burntisland. Mr. Young mentions that in March, 1850, it was sown in a cucumber-bed, and got no more heat, but as it advanced in height was covered by additional frames, put on the top of each other. The grain ripened in October of that year. It is cultivated in India, under the name of "shaloo." 3. From Mr. Brown, wood-merchant, Edinburgh :—A stem of *Copernicia cerifera*, and slabs of mahogany and Yacca wood. 4. From Mr. Cobbold, Broughton Park :—A Peruvian hammock made from a species of grass. 5. From Messrs. Marshall & Co., Leeds :—Sample of raw China grass (produce of *Boehmeria nivea*) as imported from Canton ; also threads, yarns, and bleached drill, manufactured from the same. 6. From Colonel Ferguson, Raith :—Cones of *Abies Douglassi*. 7. From Lady Scott :—Two sections of black bog-oak, dug from a peat-moss at Lochore, Fifeshire. 8. From Mr. Cunningham, West Bow :—Manure made from the bruised seed of *Ricinus communis* (castor-oil-plant). 9. From Mr. Anderson, Oxenford Castle :—Root of an elm-tree taken from a drain, and a mushroom in an abnormal condition. A figure of the mushroom in its recent state was shown. It would appear that two mushrooms had united together, by the summit of their pileus, in the young state, and that one had afterwards grown so vigorously as to detach the other from the soil, and bear it on the top of its pileus inverted. The substance of the pileus of the two mushrooms was intimately united. In the lower mushroom the lamellæ were, as usual,

on the lower surface, while on the upper surface, the pileus being inverted, the lamellæ appeared above. 10. From Mr. M'Phail:—Specimens of hazel-nuts, accompanied by the following note:—"The hazel-nuts which I hand with this note were found in a large moss-drain in the Island of Lewes, in February, 1849, at a depth of nine feet from the surface. The locality in which they were found is at the sea-side, perhaps 200 yards from the sea-mark, and at the foot of a broken rock slipping into the moss. There is no native hazel to be seen now in that locality, except one small bush, which is cut down by the natives whenever it ventures to push out a sprout, striving for existence in the summer. The above-mentioned bush is about a quarter of a mile from the place where the nuts were found, and probably the only native hazel-tree in all the island." 11. From A. H. Balfour, Esq., surgeon, Hong-Kong:—Specimens of physic-nut (*Jatropha Curcas*). Mr. Balfour states, in a letter, that two ladies had swallowed, the one three or four, and the other seven or eight, of the physic-nuts growing at Hong-Kong. Within half an hour after they had eaten them they were seized with violent vomiting and diarrhœa, which lasted for a considerable time, and were relieved by the use of sedatives. The seeds are pleasant to the taste. They yield, on pressure, a considerable quantity of oil, which the Chinese use for varnish and for burning. 12. From J. G. Morison, Esq.:—Specimens of paper made from the Sicilian Papyrus, sent by Mr. M., from Messina. 13. From Mrs. Balfour:—Specimen of a cross made in Ireland, from the pith of the elder, with figures carved on it. 14. From the Rev. G. Macfarlane:—Specimens of *Lepidostrobus* and of a Calamite from Burdiehouse.

Mr. Bryson sent for exhibition under the microscope a section of the stem of *Phytocrene gigantea*, a gigantic, climbing shrub, belonging to the natural order Urticaceæ, found in India, and figured in Wallich's '*Plantæ Asiaticæ Rariores*,' vol. iii. tab. 216. The section showed a large, cellular, central pith, surrounded by a vascular layer, proceeding from which were seen eight wedges, composed chiefly of porous vessels, alternating with eight narrow bundles of pleurenchymatous vessels and cellular tissue. The wood is soft and porous; and Dr. Wallich states that in dividing the stem, which sometimes measures eighteen inches in diameter, a large quantity of a pure and tasteless fluid flows out, which is quite wholesome, and is drunk by the natives. Hence it has been called "Vegetable Fountain."

Mr. M'Nab exhibited a flower of *Arum cornutum* from the Botanic Garden.

Dr. Balfour showed an instrument, prepared by Messrs. Smith & Beck, for making circular cells for microscopic preparations.

The following papers were read:—

1. 'Remarks on the Growth of the Jalap-plant (*Exogonium Purga*), and of the Scammony-plant (*Convolvulus Scammonia*), in the open ground of the Botanic Garden;' by Professor Balfour. After alluding to the cultivation of the jalap and scammony plants in Britain, Dr. Balfour read the following remarks, by Mr. M'Nab, on their growth in the open air in the Botanic Garden:—"The *Exogonium Purga* has been cultivated in the Edinburgh Botanic Garden since 1838, but always in a greenhouse, or a cold, glazed pit protected from frost. During the summer of 1850 a plant of *Exogonium* was placed in the open air, in the medical department of the Garden, in soil composed of loam, leaf-mould, and sand, and protected with a hand-glass for six weeks. It soon commenced growing, and flowered during the months of August and September of that year. In autumn, after the stems had died down, some horse-manure was laid on the surface of the soil, above its tuberous roots, six inches deep, and afterwards covered with soil. This covering was allowed to remain till March, 1851, when the superfluous manure was removed, and the remainder dug into the ground around the roots. A hand-glass was then put on, and allowed to remain till June. By this time the plant was growing freely, and flowered during the months of August and September of 1851. The same treatment was adopted during the autumn of 1851 as was done during the previous autumn; and the roots, when recently examined, were found to be in a growing state. The tuberous roots of *Exogonium* are very susceptible of frost, and require to be deeply covered for protection. The under-ground stems, when cut in pieces, placed in pots of sand, and plunged in bottom heat, root freely at this season of the year. During the month of May, 1851, a plant of the scammony was planted in the open air, in the medical department of the Garden, side by side with *Exogonium Purga*, above described. It was planted in a mixture of loam and sand, and protected with a hand-glass for six weeks. When the hand-glass was removed it was allowed to ramble up some small, branched sticks. It grew freely, and showed numerous flower-buds, but few expanded, and these during the month of September. The stems were destroyed at the same time with the *Exogonium*, and were afterwards treated in the same way as it. The roots are now quite fresh (March 10, 1852), under a hand-glass. Through the kindness of Mr. Moore, of the Chelsea Botanic Garden, we received, during March, 1851, a packet of scammony-seeds. With

the aid of gentle heat they soon commenced to vegetate. When sufficiently matured one of the plants was placed in the open-air medical department, as above directed; at the same time some seedlings were planted in a glazed frame, in very rich soil, composed of decayed manure, leaf-mould, and loam, and kept quite close for one month. In this situation they grew freely, extending their shoots full eight feet from the roots; they produced innumerable flower-buds, but not more than two dozen flowers fully expanded. Like those in the open air, they were checked by frost. After the stems had entirely decayed a slight coating of horse-manure was placed over the roots, which were afterwards protected with a glazed frame, and are now (March 10, 1852) beginning to grow. Like the *Exogonium*, it can be propagated by cuttings of the roots, or by seed, which ripens freely in the more genial climate of England."

2. 'On the Rate of Growth of the Bamboo (*Bambusa arundinacea*) in the Botanic Garden;' by Mr. M'Nab. Mr. M'Nab laid before the meeting a statement of the growth of a bamboo-stem in the palm-house of the Royal Botanic Garden, from the time it first showed itself above the soil (July 15, 1851) till the 31st of August, being a period of the year when artificial heat was almost entirely withheld. Each day's observation was made at six a.m. The entire growth in the forty-seven days was 187 inches, or about $4\frac{1}{2}$ inches per day.

3. 'Notice of a case of Extensive Poisoning by one of the Cape Iridaceæ;' by Allan Dalyell, F.R.S.E., late Lieutenant of the 27th Regiment; communicated by Dr. Douglas Maclagan. The author observes:—"The perusal of an interesting paper on Colchicum, by Dr. J. M. Maclagan, in the 'Monthly Medical Journal' for November last, reminded me that I possessed the sketch of a Cape plant, with whose poisonous properties I accidentally became acquainted. During 1841 (I write from memory), when Lieutenant of the light company of the 27th, forming part of the left division of demonstrative force ordered to the Orange River, on one occasion, after a march, arduous from its length, but especially distressing from excessive drought, a halt was made on the banks of the Little Fish River, near the village of Somerset. That evening eighty of the baggage and artillery oxen were reported dead, and next morning forty more were found poisoned, having eaten the flowers of a small Iris-like plant, which grew in abundance around the encampment. During the following year, whilst in command of the 'Tarka,' I had many opportunities of renewing acquaintance with the same plant, not, however, under similar circumstances; it is only when oxen are so far exhausted

by over driving as to lose their discriminative instinct, in the hurry of impetuous hunger, that poisoning follows its presence in their grazing-grounds. The nature of the locality where it grew at the 'Tarka' closely resembled that at Somerset; the flats above the bed of the Swart-kie, at the former, as those of the Fish River at the latter place, produced it in abundance. The plant was always regarded as an enemy; but I never saw it eaten by cattle except in the instance which I have detailed. It is not possible for me to state the precise time in which, in any one individual, death followed from eating it. I think, however, I may venture to offer from three to nine hours as the most probable time. Long before the heat of day had operated on the dead, the dilated eyes and frothy nostrils and mouths of the poisoned cattle were commented upon, whilst we scrambled over them at morning parade, as indicative of a more suffering death than such faithful companions of our toils deserved. Symptoms of gastritis were marked by their previous moanings. Further than this, however, it is not in my power to speak with certainty. I am indebted to the kindness of Professor Balfour for the probable botanical name of the plant. A rough sketch, taken at the 'Tarka,' has been identified as that of *Vieusseuxia tripetaloides*, one of the Iridaceæ, an order numerous represented in Southern Africa. It only remains for me to state that, from the solidity of the soil, it is next to impossible that any of the roots could have been got up. Poisoning was therefore due to the flowers, stem, and leaves. I have also every reason to believe that every one of the oxen which ate the plant died."

Dr. Balfour stated that he had determined the plant, as far as possible, from the drawing by Mr. Dalyell, and that he considered it to be the *Vieusseuxia tripetaloides*, DC., *Iris tripetala* of Thunberg, and *Moræa tripetala* of Ker. He also stated that several of the Cape Iridaceæ seemed to be poisonous, and referred especially to *Homeria collina*, as noticed in Dr. Pappe's 'Prodromus of the Cape Medical Flora.' "I introduce this plant," says Dr. Pappe " (which is known to almost every child in the colony as the Cape-tulip), not for its therapeutical use, but for its noxious properties. The poisonous quality of its rhizomes appears to have been known to some extent years ago, but judging from the rapidity with which death ensued in a recent case, when they had been eaten by mistake, it must be of a very poisonous kind. To Dr. Lang, Police Surgeon of Cape Town, I am indebted for the particulars of a most melancholy case of poisoning caused by this plant. A Malay woman, somewhat advanced in years, with her three grandchildren, respectively of the ages of 12, 8, and 6,

partook, on 18th of September, 1850, of a supper consisting of coffee, fish, and rice, and ate along with this a small basinful of the bulbs of *Homeria collina*. The exact quantity which each ate is not well known. They appear to have supped between seven and eight, and retired to bed at nine o'clock, apparently in good health. About one in the morning the old woman awoke with severe nausea, followed by vomiting, and found the children similarly affected. She endeavoured to call for assistance, but found herself too weak to leave her bed; and when, at five o'clock, assistance arrived, the eldest girl was found moribund, and expired almost immediately. The little boy of eight years died an hour afterwards, and the youngest child was found in a state of collapse, almost insensible, with cold extremities, pulse scarcely fifty and irregular; pupils much dilated. The symptoms of the grandmother were nearly similar, but in a lesser degree, accompanied by constant efforts at vomiting. By using diffusible stimulants she and this child eventually recovered."

4. 'Notice of the Number of known Fossil Plants at different Epochs, and of the Natural Orders to which they are referred;' by Professor Balfour. After alluding to the division of the Fossil Epochs, as given by Brongniart, *viz.*, into the reigns of Acrogens, of Gymnosperms, and of Angiosperms, Dr. Balfour proceeded to give an analysis of the orders of fossil plants, as given by Unger. The following general tabular view was compiled from Unger's work:—

DICOTYLEDONOUS FOSSIL PLANTS.

	<i>Genera.</i>	<i>Species.</i>
Thalamifloræ - - - - -	24	84
Calycifloræ - - - - -	49	169
Corollifloræ - - - - -	30	73
Monochlamydeæ Angiospermeæ - - - - -	48	221
„ Gymnospermeæ - - - - -	56	363

MONOCOTYLEDONOUS FOSSIL PLANTS.

	<i>Genera.</i>	<i>Species.</i>
Dictyogenæ - - - - -	2	5
Petaloidæ - - - - -	36	125
Glumaceæ - - - - -	5	12
ACOTYLEDONOUS FOSSIL PLANTS - - - - -	152	1172
UNCERTAIN FOSSIL PLANTS - - - - -	38	167

These plants are arranged in different strata, as follows :—

	<i>Species.</i>
Cambrian, Silurian, Devonian, and Old Red Sandstone (older and middle Palæozoic) - - - - -	73
Carboniferous - - - - -	683
Lower Red Sandstone (Permian) - - - - -	76
Magnesian Limestone - - - - -	21
Upper New Red Sandstone - - - - -	38
Shell Limestone - - - - -	7
Variegated Marls - - - - -	70
Lias - - - - -	126
Upper, Middle, and Lower Oolite (Jurassic) - - - - -	168
Wealden (Wealden Clay, Hastings Sandstone, Pembroke Beds)	61
Chalk (Greensand) - - - - -	122
Tertiary Eocene - - - - -	414
„ Miocene - - - - -	496
„ Pliocene - - - - -	35
Diluvian - - - - -	31

Fossil species 2421

After alluding to Sir Charles Lyell's observations on the Flora of the Carboniferous Epoch, as given in his late introductory discourse to the Geological Society, Dr. Balfour referred to Raulin's account of the Flora of the Tertiary Epoch in Central Europe. By this it appears that :—

1. The Eocene Flora is composed of 127 species, of which 115 belong to Algæ, Characeæ, Ulvaceæ, Palmæ, Naidaceæ, Malvaceæ, Sapindaceæ, Proteaceæ, Papilionaceæ, and Cupressineæ.

2. Miocene Flora, 130 species, of which 69 are Algæ, Palmæ, Naiadaceæ, Apocynaceæ, Aceraceæ, Platanæ, Lemnaceæ, Papilionaceæ, Quercineæ, Myricaceæ, and Abietineæ.

3. Pliocene Flora, 259 species, of which 222 are Algæ, Fungi, mosses, ferns, palms, Ericaceæ, Ilicineæ, Aceraceæ, Celtideæ, Rhamneæ, Papilionaceæ, Juglandaceæ, Salicineæ, Quercineæ, Betulineæ, Taxineæ, Cupressineæ, and Abietineæ.

The Eocene species are allied to genera now found in intertropical regions—India, Asiatic Islands, and Australia. Some are peculiar to the Mediterranean region. The aquatics, which form nearly one-third of the Flora, are related to genera now found in temperate regions of Europe, and in North America.

The Miocene species belong to genera found now in India, tropical America, and other intertropical regions, but of which the greater

portion inhabit subtropical and temperate regions. Some are generally found in India, Japan, and the north of Africa.

The climate of Europe during the Tertiary Epoch appears to have been becoming more and more temperate, by a gradual process of cooling.

Mr. M'Nab read the following report on the state of vegetation in the Edinburgh Botanic Garden, from the 11th of February till the 11th of March, 1852:—

Name.	Dates of Flowering.		
	1852.	1851.	1850.
	Feb.	Feb.	Feb.
<i>Helleborus orientalis</i> - - - -	14		
<i>Arabis albida</i> - - - -	15	7	21
<i>Symphytum tauricum</i> - - - -	16	6	
<i>Crocus vernus</i> and varieties - - - -	18	3	26
<i>Primula denticulata</i> - - - -	19	15	23
		March.	March.
„ <i>nivalis</i> - - - -	20	16	1
		Feb.	Feb.
<i>Symplocarpus foetidus</i> - - - -	20	4	18
		Jan.	Feb.
<i>Leucojum vernal</i> - - - -	21	20	18
		Feb.	
<i>Arabis precurrens</i> - - - -	21	1	24
<i>Anchusa sempervirens</i> - - - -	21	14	26
		Jan.	March.
<i>Tussilago alba</i> - - - -	27	26	12
„ <i>nivea</i> - - - -	27	28	2
	March.	Feb.	
<i>Pulmonaria angustifolia</i> - - - -	1		
„ <i>mollis</i> - - - -	2	7	11
<i>Adonis vernalis</i> - - - -	6	18	16
		Jan.	
<i>Dondia Epipactis</i> - - - -	8	4	

Mr. Evans stated that the apricot began to flower in the Experimental Garden on the 1st of March.

Mr. M'Nab laid before the meeting a record of thermometrical observations made in the Botanic Garden.

George Sharp, Esq., was elected a Fellow of the Society.

Notices of the Flowering Time and Localities of some Plants observed during an Excursion through a portion of South Devon, in June, 1851. By EDWIN LEES, Esq., F.L.S.

I COMMENCED my progress on the 27th of May, on the afternoon of which day I crossed the estuary of the river Exe at Starcross, and took up my quarters at Exmouth. The flowery signals that proclaimed the decided advent of the summer season were the elder and yellow Iris, in flower, and *Malva rotundifolia*, just displaying its purple-veined petals. On the preceding day, when botanizing with some friends at Malvern, I had noticed that not a single corolla of *Chrysanthemum leucanthemum* had unfolded; but here the Midsummer daisies were already in full flower. Near Budleigh Salterton the red sandstone cliffs were resplendent with the sea-pink (*Armeria maritima*), in its finest perfection, varied by extensive masses of the yellow-flowered "ladies'-finger" (*Anthyllis Vulneraria*); while *Silene maritima* cast a silver robe of beauty over the lurid, massive cliffs in many places. *Spergularia marina* also adorned the rocks in numerous spots.

But by thus marking "the time of flowers," I only intend briefly to remark upon such plants as fell under my notice, either less common than usual, localized at particular points, or in some other way worthy of passing remark. As it will be more convenient to notice them as they met my view, I shall do so rather than arrange them by the *orders* of any Flora.

Iris foetidissima. Profusely abundant all along the southern coast of Devon, its blue-veined flowers forming quite a feature in the woods at this time, and the stiff green leaves cresting the sides of every shady lane. The bruised foliage has a peculiar smell, something like roast beef, complained of by Hooker and Arnott, in the last edition of the 'British Flora,' as "very disagreeable;" so that from its frequency in Devonshire "one can hardly avoid walking among it"* when herborizing, and being *annoyed* by the smell. It seems odd that learned botanists should object to the scent of roast beef if unattainable at the time; and I must say that the "roast-beef-plant" exhales no unpleasant odour to me. It commences flowering in May, and continues expanding throughout the whole of June, though, as usual, our Floras are behind time respecting it. The corolla soon shrivels up and loses its beauty.

* Brit. Flor. 6th edit. p. 427.

Ænanthe pimpinelloides. I found this *Ænanthe* occupying the red sandstone cliffs between Budleigh Salterton and Exmouth in strong force, on dry, hard ground, just as it occurs in Worcestershire. Yet it grew very luxuriantly in such spots; while on the sea-beach not a single specimen occurred. I also noticed it growing finely on a dry bank on the way to the old church of St. John in the Wilderness. The first, with expanded flowers, was noted on the 30th of May. Mr. Babington, in his Manual, has indicated 7—9 as its period of flowering, the same as for *Æ. Lachenalii*; but even about Worcester *Æ. pimpinelloides* is always in full flower in the 6th month, and is in fruit when *Æ. Lachenalii* commences flowering, a month later. The practical collecting botanist will find this worth attending to. Some very tall specimens I gathered had long general as well as partial involucre; but this is not usually the case. The broad-lobed radical leaflets, often extending quite flat upon the surface of the ground, will always distinguish this plant from its congeners, if not in a faded state. This being so local a plant, I was desirous to trace its progress westward; but its frequency seemed to diminish in that direction, though I found it again, on a bank of red marl, above the river Teign, on the road from Teignmouth to Newton. I also met with a considerable quantity of *Æ. pimpinelloides*, growing on hard limestone ground at the foot of Torre Hill, about a mile from Torquay. The last I saw of it was in a meadow on the banks of the river Dart, near Totness. It has not as yet, I believe, been found either in Cornwall or Wales. It is remarkable that Jones, in his 'Botanical Tour through Devon' (1820), who went over a good deal of the same ground I did, makes no mention of this plant, or, indeed, of any other *Ænanthe*.

May 28.—At Budleigh Salterton, roaming along the shores of the pretty little river Otter, which was beautified with the white flowers of the lowly scurvy-grass (*Cochlearia officinalis*) along its level margin, opposite an expansion of the stream that surrounds a flat island, green with sea-weed or *Confervæ*. On the sandy margin of the river, near a timber bridge, a patch of *Trifolium subterraneum* appeared, its slender cream-coloured flowers making a pretty show, though the stems of the plants scarcely appeared emergent from the ground.

Walked by the summit of the cliffs (all red marl, based upon red sandstone) from Budleigh Salterton to Exmouth, a singularly-pleasing ramble, varied at almost every step by shelving, precipitous cliffs or broken coombs, like the "chines" of the Isle of Wight, wherever a little stream broke through the yielding strata from the interior

country. Most of the cliffs were bare, except towards their summits ; but the glens and broken declivities were covered with thickets, where privet (*Ligustrum vulgare*) was very abundant. Here, wherever the ground allowed, little potato-gardens had been formed, where doubtless, at a future time, olitory stragglers will get in, and contend for a native origin.

Some of the ravines I passed, hollowed deep into the soil, were as red and bare as the craters of a volcano. The profile of the lofty range of cliffs extending from Budleigh, when looking back towards the flag-staff, presented an appearance like monstrous giants reclining on the shore, with their feet spread out towards the sea, and was very impressive. From the head of the cliffs a down, shaggy with ling and bright with *Erica Tetralix* in several moist spots, stretched far away ; and somewhere here a friend had told me of a bog where he had gathered *Osmunda regalis*, growing very lofty and luxuriant. I struck off, therefore, for a morass I saw before me, surrounded with *Sphagnum*, which, however, proved so very wet and yielding, while a wide band of black mud lay beyond, that my efforts to get well up to it were unavailing. Evening, too, was progressing ; and with a long trudge before me I was compelled to turn my face seaward. In returning I came upon a single specimen of *Orchis Morio*, the only one I saw in my Devonshire ramble, and I presume rare in the county. In the list of plants appended to 'Jones's Botanical Tour in Devon,' *O. Morio* is entirely absent, though *O. mascula* is given.

A long point of sandstone extends far into the sea between Budleigh Salterton and Exmouth, after passing the highest range of cliffs ; and on either side of this were some singular, secluded, deep, gloomy dens, excavated by the sea, as if intended for the perpetration of deeds of darkness. On the western side of the point the sea had so broken down the sandstone rocks, that it seemed as if a huge quarry had been excavated there, such monstrous masses lay scattered about in all directions ; the cliff itself shattered almost to fragments. Further on towards Exmouth a little, curious, dark cove was formed, at a point of sandstone where its marly covering had been nearly washed away ; and it appeared like a bald old man whose hair had been denuded by the storms of life. In the twilight I descended from the cliffs to the sea-shore, where, amidst the sandy dunes, it became difficult to find a path, and so had a wearisome ramble on the yielding shingle to Exmouth.

May 31.—The floral ensigns of the solstitial season now fully con-

spicuous, *Papaver Rhœas*, *Hypochæris radicata*, *Convolvulus arvensis*, and *Malva sylvestris* being generally in flower.

The red-marl cliffs near Teignmouth were resplendent with crowded masses of the yellow "ladies'-finger" and the commoner *Lotus corniculatus*, in beautiful contrast with the silvery *Silene maritima*, in equal abundance, and all in full flower, under the influence of a bright sun and clear sky. The rose-coloured heads of the common sea-pink were just emergent from their delicate sheaths, unsoiled and exquisitely beautiful as a butterfly recently escaped from chrysalis.

Medicago maculata. Some sandy pastures on the margin of the beach at Exmouth were nearly covered with this plant, now in full flower, which seemed extending itself, as if determined to engross the ground.

Kœnigia maritima. Established among the stones of the beach near the Starcross Ferry, in some abundance; but it appeared traceable to a seaman's little garden in the immediate vicinity.

Trifolium scabrum and *striatum*. Abundant on the Strand at Exmouth.

June 1.—Took a meditative walk along the red-marl cliffs from Exmouth, until I came within view of the red-sandstone headland at Otterton, on which I lay twenty years ago, spending a day of blissful thought, whose broken links now only remain, like the disrupted masses of water-worn sandstone, lying disordered and in wild confusion along the margin of the now quiet sea.

Various littoral plants expanding their flowers, as *Spergularia marina*, *Honckenya peploides*, *Calystegia Soldanella*, and *Plantago Coronopus* and *maritima*. A single *Hyoscyamus niger* also presented itself to view, and abundance of *Daucus Carota*.

Vicia Bithynica. This hairy-podded vetch trails profusely among the degraded sandstone cliffs east of Exmouth, giving them a peculiar feature. It was now coming into flower, though the Floras give it a later assignation. I afterwards noticed it as abundant on the red-marl cliffs near Teignmouth.

Vicia Nissolia. I gathered one specimen of this beautiful vetch on the cliffs, but could not perceive another.

On the declivity of the cliffs I gathered a tall species of garlic, which, not having expanded its flowers, I could not accurately determine. As the leaves were very long, channelled, and ribbed, it was probably *Allium oleraceum*; yet they were rather flat than hollow.

Ranunculus parviflorus occurred on various dry, sandy banks in the vicinity of Exmouth.

Lepidium Smithii. Abundant on the cliffs, and nearly as tall and branched as *L. campestre*.

June 3.—Crossed the ferry at Starcross, and progressed to Tynemouth. *Rosa canina* appeared in flower, for the first time this season; and a bramble of the Cæsian group presented nearly expanded petals. About a mile and a half from Teignmouth, on the Newton road, I observed great quantities of fennel (*Fœniculum officinale*) on a wooded bank overlooking the river Teign. The bank was quite a waste, neglected spot; but the railroad intervened between it and the river, and therefore the neighbouring ground must have been subjected to disturbance within the last three or four years.

Linum angustifolium. This is one of the commonest plants on the sandy declivities around Exmouth and Tynemouth. It was now just showing expanded flowers. Some luxuriant specimens between Teignmouth and Dawlish were above a yard in height, and much branched.

Verbascum virgatum. Several specimens of this plant occurred by the side of a pathway up the cliffs between Teignmouth and the Dawlish road. The Rev. J. Pike Jones, in his 'Botanical Tour through Devon and Cornwall' (1820), mentions a *Verbascum*, rather doubtfully, that he gathered both near Teignmouth and Torquay. His plants were not, perhaps, developed well, for he says he was inclined to consider his specimens as *V. Blattaria*, but that "Mr. Anderson determined them to be *V. virgatum*." Mine were certainly the latter plant; and its long continuance in this neighbourhood is thus shown. It is remarkable that all the specimens I saw were covered with a species of *Coccus*, exuding a secretion of such a nauseous and fœtid kind, that it was almost impossible to preserve any of them.

June 4.—Wandered to the cliffs eastward of Teignmouth, and by Lower Holcombe to the "Parson's Rock," through which the railway is now tunnelled. From its dizzy summit, which is rather a dangerous position, as its crumbling edge overhangs the excavation below, there is a splendid view of the sea, with the distant cliffs of Dorset and Portland on one side, and Hope's Nose, Berry Head, and Torbay on the other. On carefully rounding the cliff the awful excavation below came fully into view, really frightful to contemplate. Yet the Devonian farmer ploughs almost to the very edge of the precipice, leaving hardly a nook for the *Plantago* or *Armeria*, which are forced upon the verge, but bringing with him a number of agrarian plants to supply their place; for here, among other attendants upon cultivation, I gathered *Papaver hybridum*, *Anthemis arvensis*, and *Campanula*

hybrida. The cliffs resounded with the screams of the hobby hawk, who kept flying restlessly about while I was upon the spot, 'probably having young in some cranny of the rock.

Orobanche amethystea. Under the railway wall next the beach between Dawlish and Langstone Cliff, I observed a brilliant amethystine-hued *Orobanche*, probably the *O. amethystea*, *Thuill.* It was very evidently parasitical upon *Plantago Coronopus*, having so got upon its roots as to elevate the *Plantago*, in a shrivelled state, between its own stems. I made the following note of it while in a fresh state:—"Stem pale below, bright vinaceous purple and very hairy-glandular above; bracts very hairy, pointed, almost as long as the corolla, recurved at the point; sepal finely hairy, bifid, narrow and sharp-pointed, not so long as the tube of the corolla; corolla tubular, remarkably bent on its first expansion, yellowish-brown at the base, above beautifully tinged with purple, with longitudinal darker streaks, interior brownish, with purple lines, upper lip wavy and denticulate, lower lip in three slightly unequal, notched divisions; stamens white, hairy only at the base; style purple, polished, smooth, stigma smooth, with slightly-divaricated lobes. Much more glandular and hairy than *O. minor*, for its clammy exudation had not only caused the stem to be covered with particles of sand, but these stuck even to the scabrous upper tube of the corolla."

June 7.—After some showery weather I took advantage of a splendid summer's day to make a traverse to Torquay and Anstey's Cove, the latter noted as a locality for several rare plants. Having described this in detail (*Phytol.* iv. 236), I shall only here observe that, not taking the nearest way, I accidentally stumbled upon "Daddy's Hole," so called, a remarkable broken chasm in the limestone rock, with a precipitous descent to the sea, which well deserves a visit from botanist or tourist. The rocks here were covered with the local *Helianthemum polifolium*, in full flower, its silver petals giving a transitory beauty to a spot that must be dismal enough when shrouded by the tempest or swept by the cutting gale. The *Helianthemum* has here a very wiry and shrubby aspect, its hoary leaves often so revolute as to appear like legumes: sepals and capsules densely tomentose. *Hippocrepis comosa* was also in flower on the face of the cliff; and the turfy down was beautiful with abundance of the rosy-tinged *Spiræa Filipendula*.

Pyrus Aria. On several scarcely accessible spots on the face of the cliff at "Daddy's Hole," as well as at Anstey's Cove, but the flowers past perfection. Doubtless this is the true *Aria*; but the

leaves vary much in breadth, and depth of indentation, on the same branch; the acute, entire, wedge-shaped base of them is, however, characteristic. *P. scandica* of Babington, with the leaves deeply cut and lobed, and serrated to the base, I have gathered on the cliffs near Minehead, North Devon. Whether a good species or not, it has no appearance of being a hybrid, as suggested by Dr. Walker Arnott, in the sixth edition of Hooker's 'British Flora.' The celebrated Castle Dinas plant, now queried in the latter work, is really a mere variety of *P. Aria*. In the autumn I observed perfect fruit of *Aria*, which is bright, polished red, crowned with the persistent floccose calyces. The pomes are very variable in size.

Orobanche Hederæ. This plant was growing among the ivy that overspread many of the precipitous rocks fronting the sea at "Daddy's Hole;" and I observed much of it also both at Anstey's Cove and among the rocks of Babbicombe. Surely this species of *Orobanche* must have much increased of late years, for it is unnoticed in Smith's 'English Flora' or the second edition of Hooker, yet is now found to be generally dispersed and plentiful all along the coasts of Wales and the south of England. I gathered it this year on Brean Down, Somerset. I penned the following description from a fine and perfect fresh specimen, parasitical on ivy at Anstey's Cove:—"Stem fourteen inches in height, dull purple at the base, bright vinaceous above, where it is closely covered with white, glandular, clammy hairs; flowers rather numerous, extending half way down the stem, generally more than twenty; corolla tubular, curved, and spreading horizontally, at first of a pallid primrose colour, tinged with purple on the upper part, with longitudinal purple veins, slightly glandular-hairy along the ridge of the upper limb; upper limb of corolla wavy, denticulate, strongly veined within, lower in three lobes, each tripartite, middle one longest, the lateral lobes denticulate; bracts hairy-glandular, as long as the corolla, their points curved downwards in maturity; calyx downy-glandular, the sepals with long, subulate, unequal points, and strongly nerved; stamens inserted a little above the base of the corolla, quite glabrous, or with only a few inconspicuous hairs on the lower half; ovary smooth, yellow; style glabrous or slightly scurfy, as seen through a lens, stigma smooth, yellow, the lobes cohering, with scarcely any division."

Viburnum Lantana. Abundant about "Daddy's Hole," and now exhibiting green fruit.

June 9.—Visited Watcombe, a singular, broken cove at the seaside, about six miles from Teignmouth, on the old road to Torquay.

I noticed in my way to the ferry that *Senebiera didyma* was an abundant weed in one of the streets at Tynemouth leading to the Den. After crossing the river Teign, a fine, bold, sandstone rock, called the Ness, now planted with firs, blocks up the direct way. *Lathyrus sylvestris* here dangled from the rocks, and *Origanum vulgare* was abundant. In waste places by the side of the road, after ascending the hill, there appeared some fine patches of saintfoin (*Onobrychis sativa*), in full flower, but it may be doubtful whether truly native there, as the land is here cultivated to the very verge of the cliffs. In a field close to the road a quantity of *Agrostemma Githago* made a very curious appearance, almost filling the ground, in regular rows, as if purposely planted there. But on close examination I found that the field had been sown with vetches, and that a flock of sheep had been turned in. These had quite eaten up the vetches, but neglected the corn-cockles, which had now grown so lofty and luxuriant as actually to hide the sheep, and seem as if they were flourishing there for some useful purpose. From their quantity they certainly made a brilliant show, as they were at this time in full flower.

Between Stoke Common and Minnicombe, in a wild, heathy part of this road, I noticed more *Rubi* than I saw anywhere else in the vicinity, for none were of common occurrence, except *R. discolor*, which at Babbicombe luxuriated within the dash of the waves. The following forms here occurred, in wild, heathy spots:—*R. cæsius*, *R. sublustris*, *R. carpinifolius*, *R. Lindleianus* (*nitidus* of Bell Salter), *R. affinis*, and *R. Idæus*, var. *trifoliatus*.

At Watcombe a lofty mass of precipitous sandstone rises up boldly, with a fine effect, some distance now from the sea, though many remarkable water-worn cavities upon its face testify to the surging force of the waves upon it at some former period, when its face was ruffled; and geological change has now left the precipice a strangely-marked and conspicuous object. This place was quite overrun with thistly care. The lofty *Carduus Marianus* was here rampant in profusion along the bases of the dry rocks; but how long such an immigrating wanderer may be likely to stay in the locality, or how long it had been there, is more than I can venture to say. *Carduus tenuiflorus* also occupied the ground in great force, and, indeed, I found it plentiful along the whole line of the Devonshire coast that I traversed.

The preference shown by some lichens for a particular mineral composition of rock was here very apparent. A portion of trappoid conglomerate intervened between the honeycombed sandstone rock and the sea-cliff; and just here *Squamaria crassa*, though deeply

stained with red from the colour of the rock, abounded in fine fruit ; but nowhere upon the pure sandstone could I discover a single particle of it.

Sedum glaucum, Smith, (*S. reflexum*, β . *Bab.*). In my way back to Teignmouth I gathered a very glaucous *Sedum*, growing on a mass of conglomerate rock by the road-side, which is probably the plant of Smith, in *Eng. Flora*, being a more slender and elegant plant than *reflexum*, the leaves narrower and sharper pointed, and the lower ones not recurved. It was just showing for flower ; the cymes recurved, smaller and less crowded than in *S. reflexum* ; sepals elliptical, petals very pale yellow.

Potentilla Tormentilla, *var. reptans*. This occurred on the road-side, in full flower ; and from much observation of it I should dis sever it as distinct from *officinalis*, as Linnæus did. Surely the creeping habit, and long, silvery pubescence of the leaves, well distinguish *reptans* from *officinalis*. The receptacle is excessively hairy, and the stem often trails a great length without rooting.

June 13.—At Anstey's Cove, near Torquay. Here the privet, abundantly covering the broken rocks, was just coming into flower and expanding its petals, well denoting the approach of the solstitial time. *Vicia sylvatica* and *Melittis Melissophyllum* were also well in flower. But *Sedum rupestre*, in great abundance among the limestone rocks here, only as yet showed its cymes, bent downwards, with unopened petals. A bramble (*R. dumetorum*), however, true to its affinities, was showing opened flowers, though sparingly. *Cornus sanguinea* and *Agrimonia Eupatoria* in like manner revealed "the time of flowers" with their expanded petals, as well as *Solidago Virgaurea*.

Centranthus ruber. The red valerian appeared very plentifully on rocks all about Torquay, making a vivid show ; and I afterwards saw it on walls at Dartmouth.

Clematis Vitalba. Everywhere most abundant, as well on the red marl about Tynemouth as on the limestone rocks at Babbicombe and Torquay ; yet in a recent work on the Botany of Devonshire, by Dr. Fraser Halle, no mention is made of its occurrence.

June 14.—Ascended from Tynemouth by the old Exeter road to Little Haldon Hill, progressing thence to Ashcombe, and descending to Dawlish, by a deep, winding road, up hill and down dale. The cheerless heights of Haldon are of the greensand formation, and their surface covered over with loose flints. A sombre view appears hence of the Tors of Dartmoor, robed in impervious gloom ; while the intervening country in that direction appears like a desert, without an

inhabitant. The Haldon hills, rising to 700 or 800 feet, present a somewhat subalpine botanical aspect; and bogs occur on their slopes and defiles, which nourish the *Pinguicula lusitanica*, *Drosera longifolia*, *Hypericum elodes*, *Myrica Gale*, *Narthecium ossifragum*, and *Eriophorum angustifolium*. The latter plant was now beautifully conspicuous, in flossy patches of snow-like whiteness. *Erica Tetralix* was equally abundant, and *Rubus Idæus* in profusion.

Ling and gorse of course formed dense, bushy masses in the hollows and along the ridges of the hills; and *Ulex Gallii* was quite as large and abundant as *Europæus*: but none of the former species was as yet in flower; while the latter was still in golden glory. It was remarkable, too, to observe that, though both species grew intermixed, yet, while *Cuscuta Epithymum* abounded so much on *U. Gallii* as to beard its branches with innumerable purple strings and knots, not a single plant of *Europæus* was attacked by the rampant dodder. Dr. F. Halle, whose botanical work on "the Vale of Teign" I before alluded to, but whose gatherings are mostly the very commonest plants, mentions the gorse on Haldon as *U. nanus*, and gives the following anecdote, which is good enough in its way, if not a repetition of an old story:—"A gentleman in this part of England, having told a labourer on his estate to cut down and bring to his house a cart-load of *furze*, saw him, with considerable astonishment and anger, arrive some time afterwards with a load of young *firs*, part of a valuable plantation."

Near Tynemouth, in my way, I gathered *Barbarea præcox*, mentioned by Sir J. E. Smith as growing in this vicinity years ago; and on the rise of Little Haldon some quantity of *Arabis hirsuta* occurred, in flower, growing very tall. This is not noticed by Jones, in his 'Botanical Tour in Devon;' neither is it mentioned by Dr. Halle.

Rosa villosa and *inodora*. I gathered these two species of rose in bushy places about the Haldon downs; but the tribe appeared by no means beautiful or abundant in Devonshire. *R. canina* was, indeed, plentiful, but with very pale flowers; and *R. arvensis* presented itself occasionally. *R. rubiginosa* grew on the cliffs between Exmouth and Budleigh Salterton, and at Anstey's Cove, near Torquay.

Anchusa sempervirens. This plant presented itself in some plenty by the side of the road between Ashcombe and Dawlish, about a quarter of a mile from the Ashcombe school-house. I do not know that this locality has been ever given; but Jones mentions it at "Moreton and North Bovey."

Cotyledon Umbilicus. Abundantly in flower on rocks and walls in

all directions. This plant shows its congeniality to the moist, mild climate of Devon, by immigrating to the old trunks of trees, where it makes a very pretty appearance, but is always confined to rocks and walls in the midland counties. Some grotesque old pollards in a romantic lane above Dawlish were almost covered with the *Cotyledon*; and I was afterwards particularly pleased by the look of a lofty oak on the banks of the river Dart at Sharpham, whose bole was studied with a host of small *Cotyledons* to a great height up the tree.

On emerging from the deep lanes I had been tracking, there appeared a splendid prospect of the quiet sea from the heights above Dawlish, with the long, sandy neck of the Warren and the white houses of Exmouth opposite. This "Warren," near Dawlish, which is a mere sandy islet, accessible at low-water, has of late years merited the attention of botanists, as a habitat for *Trichomena Columnæ*, first found here by Messrs. Milford and Trevelyan, in 1834. It is doubtless an instance of a plant extending its range from natural causes, for it deserves to be remarked, as stated by Dr. Halle, in the volume previously quoted,* that the Rev. Mr. Shepherd, Rector of Shillingford, who had known the Warren from his youth, was decided as to its recent introduction in so well-beaten a locality, and considered "that the bulb must have been brought from its proper habitat in the Channel Islands by a current of the ocean, and left by a tide on the sand."

June 19.—At Torquay, and thence to Babbicombe rocks, a beautiful locality, well meriting botanical exploration. The bay, hemmed in by limestone crags, forms a double cove, with an intervening mass of broken trap-rocks; while eastward red sandstone succeeds to the limestone; and at Petit Tor the limestone masses appear mixed up with the red strata in a very irregular manner. The beach is formed of milk-white pebbles, which, covered by the transparent green waters of the sea, has a remarkable effect, as if molten glass was poured out upon the shore. Enormous masses of red conglomerate block up the eastern side of Babbicombe Bay in fancifully-shaped piles, the "ruin of ages;" and the insidious sea still presses upon the base of the sandstone, urging it to topple down.

On the talus of the broken cliffs here *Sedum rupestre* was flourishing in the greatest abundance, as well as the common *S. acre*; and *S. anglicum*, scattered here and there, was finely in flower in the hot

* 'Letters, Historical and Botanical, relating to the Vale of Teign,' &c. 8vo. 1851.

sunshine. *Helianthemum polifolium* also adorned the rocks of Babbicombe, but less plentifully than at "Daddy's Hole," nearer Torquay. *Orchis pyramidalis* was profusely scattered about, brilliantly tinting the rocks.

Primula veris, var. ? I was particularly struck with the quantity of cowslips, in seed of course, growing among the Babbicombe rocks, as I had understood this plant was rare in Devonshire. Jones so speaks of it in his Tour; and Dr. Halle says "The cowslip is a novelty in our fields—its sister, however, the primrose, abounds." This is curious: the cowslip was abundant at Babbicome, and not a single primrose evident. The plant here, however, appeared to be a variety, distinguished by an abundant tomentum on both sides of its long-stalked leaves, which were quite silvery beneath.

Though not particularly looking for mosses, it was impossible not to be struck with the quantity and beauty of *Neckera crispa*, fringing the limestone rocks, among the recesses of which I also gathered *Zygodon Mougeotii*, not, I think, previously observed in Devonshire.

I was sorry to observe, in exploring the vicinity of Torquay, that most of the romantic rocky tors, once so characteristic of the place, were being broken up (and down too) by the destroying hand of building speculation, and hence their local plants will soon, I fear, only exist in herbaria. On one of these, between Torre and the sea, as yet only quarried, and commanding a lovely view of Torbay, I noticed numerous Leguminosæ, growing very small, among them *Trifolium scabrum* and *T. striatum*, excessively hairy, but very short, with numerous clustered heads. On this tor I also gathered a single specimen of the rare and minute *Medicago minima*. This closed my Devonian explorations.

EDWIN LEES.

Cedar Terrace, Henwick, Worcester,
March 26, 1852.

Rice Paper Plant. By DR. BOWRING.*

I MUST write a line to let you know that specimens of the "rice-paper-plant," root, leaf, and stems, are going home by this mail to Sir W. J. Hooker. They were procured by Mr. C. S. Compton, the brother of our Compton, from the crew of a Formosa junk (which was

* Extracted from Hooker's 'Journal of Botany.'

wrecked), who were picked up by the vessel in which he was a passenger,—at least, I believe so. Compton showed me a leaf of the plant. It seemed like a good-sized sycamore-leaf, very downy on the under side: but it was so shrivelled up, that it was scarcely possible to say what it was; and being the only one he had left, Compton would not let me steep it in hot water. I saw a small root also, a curious-looking thing, apparently of a marsh or water-loving plant, the pith running down to the very end. It seemed to be jointed, and was furnished with fibres at certain distances. Compton has magnificent specimens of the pith, as long as my arm and as thick as my wrist. . . . It is quite certain now that it is a production of Formosa, whence large quantities are brought over in native craft to Chinchew, where it is cut into thin sheets for the manufacture of artificial flowers, its principal use. It must occur in great plenty, as it is a *very* cheap article there. Compton has given me a beautiful piece of the pith, cleaned and prepared for cutting into sheets. It is as white as snow, about $2\frac{1}{4}$ inches long, and a solid cylinder of rather more than an inch in diameter. An incision has been made down to the centre, or nearly so, through the whole length; so that this piece would furnish several sheets $3\frac{1}{4}$ inches square. From the size of some of the sheets we see, it is evident that the pith, after being cleaned and prepared, must sometimes measure more than 2 or even $2\frac{1}{2}$ inches in diameter; so that the gigantic size of the plant, as represented in the Chinese drawing which Sir W. Hooker copied in his Journal, may not be out of nature.

As we have an opium vessel stationed in the Chinchew River, I shall make a strong effort to get some living plants through our schroffs. The name of the place from which the wrecked men said it came, is Chick-Cham-fan, in the district of Cheong-fa, in Formosa, according to the Canton pronunciation, or Chuh-tseen-fun, in Chang-heva, in Mandarin dialect.

Manufacture of Green Tea. By B. SEEMANN.* (See Phytol. iv. 514).

IN the 'Manual of Scientific Inquiry' you ask whether, in the northern provinces of China, indigo or any other vegetable dye is used in colouring green tea. Whether different processes of dyeing are pursued in the north from those of the south I cannot say, but it

* Extracted from Hooker's 'Journal of Botany.'

is certain that around Canton, whence great quantities are annually exported, the green tea is dyed with Prussian blue, turmeric, and gypsum, all reduced into fine powder. The process is well described by Sir John F. Davis ('The Chinese,' vol. iii. p. 244 *et seq*), who, however, falls into the strange mistake of supposing the whole proceeding of colouring to be an adulteration, and leaves his readers to infer that it is only occasionally done in order to meet the urgency of the demand, while it is now very well known that all the green tea of Canton has assumed that colour by artificial dyeing. I had heard so much about tea—copper plates, picking of the leaves, rolling them up with the fingers, boiling them in hot water, &c., &c.—that I became anxious to see with my own eyes the process of manufacture, of which the various books had given such a confused idea. One of the great merchants conducted me not only to his own but also to another establishment, where the preparation of the different sorts was going forward. There was no concealment or mysterious proceeding; everything was conducted openly, and exhibited with great civility; indeed, from all I saw in the country I am almost inclined to conclude that either the Chinese have greatly altered, or their wish to conceal and mystify everything, of which so much has been said, never existed. The tea is brought to Canton unprepared. After its arrival it is first subjected to cleaning. Women and children are employed to pick out the pieces of twigs, seeds, and other impurities with which it happens to be intermixed. The only sorts which may be called natural are those gathered at different seasons: the rest are prepared by artificial means. Without entering into a description of all these processes, it may suffice to take one as an example. A quantity of *Bohea Saushung* was thrown into a spherical iron pan, kept hot by means of a fire beneath. These leaves were constantly stirred about until they became thoroughly heated, when the dyes above mentioned were added, *viz.*, to about twenty pounds of tea, one spoonful of gypsum, one of turmeric, and two or even three of Prussian blue. The leaves instantly changed into a bluish-green, and, having been stirred for a few minutes, were taken out. They, of course, had shrivelled and assumed different shapes from the heat. The different kinds were produced by sifting. The small longish leaves fell through the first sieve and formed young Hyson, while those which had a roundish granular shape fell through last, and constituted Choo-cha, or gunpowder.

Notes on Plants observed in the County of Essex during the year 1851. By E. G. VARENNE, Esq.

Myosurus minimus, L. Plentiful in gravelly fields in Great Braxted, and at Layer Marney.

Nymphæa alba, L. Not unfrequent in this portion of the county of Essex, in ponds and in the parts of rivers adjacent to gardens, and also near the water-mills, in which situations it presents a cultivated appearance. But in the nooks of the Rhoden about Chigwell, where the stream winds its course through the meadows, *Nymphæa alba* abounds beneath the cool shade of the bushes. In this retired spot it flourishes in graceful luxuriance, frequently accompanied by a less striking but very interesting water-plant, the *Potamogeton lucens*.

Alyssum calycinum, L. In a clover-field near Little Coggeshall were many plants of this species last May. The seed from which the clover was raised was supposed to have been of foreign growth. But, be that as it may, I cannot help entertaining a lurking conviction that the above-mentioned locality is not the only one in which I have observed *A. calycinum* in the neighbourhood of Kelvedon, for the similarity existing between *Alyssum calycinum* and *Lepidium campestre* is so great at a distance, that something more than a passing glance is required for discrimination between the two plants.

Erysimum cheiranthoides, L. Not unfrequent in the neighbourhood of Colchester, in fields, and occasionally met with nearer Kelvedon. It was growing about dung-heaps and elsewhere on a farm at Inworth, and also in garden-ground in the same parish, last year. As the oats used on the farm were stated to have been brought from the fens, it is not impossible that the seed of the *Erysimum* was also introduced with them. Whether this latter supposition be correct or not, the plant appears perfectly at home, and has continued in flower throughout the winter.

Rosa stylosa, Desv., occurs here and there in hedges in the neighbourhood of Kelvedon, evincing no decided partiality for any description of soil. When *R. stylosa* is trimmed regularly, and kept in a dwarfish condition, its beautiful clusters of flowers are white, with a yellow eye, and its narrow fruit is very lately or rarely perfected. In this clipped and trimmed condition it might be passed over, during its flowering state, as a handsome form of *Rosa arvensis*, though the strong assurgent shoots of the autumnal period would serve to correct such an erroneous impression. But when the bush of *Rosa stylosa*

is suffered to grow undisturbed, it assumes altogether the characters assigned to it in books, and also presents its flowers, of a "pleasant pink, with the stamens and base of the petals of a glowing orange tint." This alteration of the colour of the flowers was first observed in a bush which had been growing for years, and whose lovely pink flowers had often been noticed. After a period the bush was cut down to the ground; and since then, having been kept low, it has produced white flowers only.

Rubus humifusus, Bell Salter. A small shrubbery of what I have ventured to name *Rubus humifusus* occurs in a wood at Braxted. Excepting in its size it agrees with the description of Dr. B. Salter. The prickles, as sharp as a needle, and many of them tipped with glands, are well calculated to attract the attention of the scientific student, as well as of any one who ventures incautiously to handle the plant. In a smaller form this *Rubus* occurs in woods about Messing; but, from its having been considered one of the rarer species of its perplexing genus, I always entertained a fear of applying a name to it, until I met with the plant at Braxted, the discrimination of which latter proved a matter of little difficulty.

Pyrus communis, L. Gerard says, "The wild peares grow of themselves in most places, as woods, or in the borders of fields, and neere to high waies." Ray says of the pear-tree, "In sylvis et sepi-bus passim occurrit." The case is very different now, for it is very rare to meet with a wild pear-tree about Kelvedon in any of the places mentioned by these old authors. There are, however, one or two examples of this elegant tree in the borders of fields at Riven Hall fully as lofty as the fine elms amongst which they grow.

Ceanothe pimpinelloides, L. Road-sides, corn-fields, and meadow-land about Wigborough and Virley produce this species of *Ceanothe* plentifully. Though the above-mentioned places abut upon Salcot Creek, yet the plant is not to be found upon the saltings which bound the meadows and corn-fields, and intervene between these latter and the salt-water. In the early flowering condition, and to a distant glance, *Ceanothe pimpinelloides* bears somewhat of a resemblance to certain states of *Pimpinella saxifraga*, and also to young plants of the wild carrot, for which latter, in riding by, I suspect myself to have passed it over. The tubers are well known to the rustic population of the locality by the name of pig-nuts.

Anthriscus Cerefolium, Hoffm. In a hedge at Kelvedon, on the borders of cultivated land and garden-ground; perhaps originally a

straggler from cultivation, though the plant has occupied its present position for many years.

Valeriana officinalis, L., as described in the last edition of Babington's Manual, is not found about Kelvedon; the form of the species growing there, as well as in other parts of the county of Essex, as far as I have seen, agreeing with the description in that work of *Valeriana sambucifolia* ("Mikan.") Of a certainty the terminal leaflet appears larger than the others.

Inula crithmoides, L. Shore at Mersea Island, near Salcot Creek, abundantly.

Jasione montana, L., does not grow on Tiptree Heath, nor upon the description of gravel abundant there, as well as in other parts of the county. I have only met with this plant in a pit of fine red gravel and sand at Braxted, near Kelvedon, where it is accompanied by *Filago apiculata*, G. E. S.

Galeopsis ochroleuca, Lam. Pretty abundant in two or three light, gravelly, corn-fields at Berechurch. *G. ochroleuca* grows up along with the wheat, and is in perfection about the time of harvest when the reaping takes place; so that it is difficult to obtain good specimens of it without trespassing and doing damage. For a similar reason the plant is likely to escape detection, inasmuch as prowling botanists are not welcome visitors in standing crops of corn or amongst luxuriant clover. A friend who kindly accompanied me, for the purpose of gathering specimens for the Botanical Society, was fully impressed with the idea that the same plant used to grow in gravelly corn-fields on a farm at Bures, in Essex. I have not as yet had any opportunity of verifying the correctness of my friend's statement, but hope some day to be able to do so; the more so, as the locality itself is not an unlikely one, and also because it is not easy to imagine the description of plant which has been confounded with *G. ochroleuca*, if a mistake has been made by my informant.

Cynoglossum sylvaticum, Hænke. From lack of sufficient knowledge I have stated, in a previous number of the 'Phytologist,' that this plant is found in many parts of East Essex; but the truth is, that I mistook the green and scentless variety of *C. officinale* for the present plant. However, *C. sylvaticum* still grows pretty abundantly in one situation at Great Braxted, where it was most probably noticed by Ray; and it may be also seen occasionally on one or two other banks in the same parish. In the latter situations it is exposed to the road; and the young plants are soon devoured by some of the loose quadrupeds which are turned out by gipsies and other vagrants to

crop off the exuberant vegetation that diffuses itself over the banks in the months of May and June.

Chenopodium olidum, Curt. Kelvedon; Messing. This unpleasantly-scented herb picks out the sides of paths in gardens and in allotment-fields for its peculiar habitats in the above-mentioned parishes. About London it always used to be found at the bottom of walls. But both in London and in Essex it retains its unpleasant odour, notwithstanding old Gerarde's observation, that in localities similar to those above mentioned it "doth somewhat alter his smell, which is like tasted cheese."

Rumex pratensis, M. & K. Inworth, Messing, and Kelvedon, in damp places by road-sides where the water has stagnated during winter. It is difficult to obtain good fruited specimens of this plant, for many of the genus to which it belongs are under the ban of agriculturists, and are cut up and destroyed with persevering assiduity.

Parietaria erecta, Koch. Chipping Hill, Essex. Appears to differ from *P. diffusa* in its habit, and in the form of its leaves, rather than in the exact number of flowers in the involucre. The number of flowers in the involucre of *P. diffusa* is variable in the same plant in different seasons, for one which has been under observation for several years, which has been frequently examined, and which always appeared to present the regular number of flowers in the involucre, afforded last year a variety, of from three to six flowers in lieu of the regular number.

Scirpus maritimus, L. Margins of a pond near Oldfield Grange, Coggeshall, an inland locality for this generally maritime plant, which, however, does not altogether confine itself to salt-water. *S. Tabernæmontani* was associated along with *S. maritimus* by the side of the same pond there; this latter being mostly an inhabitant of brackish water in the county of Essex.

Carex elongata, var. *C. Gebhardi*, Reich. Chaulkney Wood. In this locality *C. Gebhardi* appears a stunted variety of *C. elongata*; the plant struggling, as it were, for existence, and maintaining a feeble growth in spots of the wood which once were boggy and moist, but which are now rendered of a different character, by draining and other operations.

Carex arenaria, L., *C. divisa*, Huds., *Phleum arenarium*, L., *Festuca uniglumis*, Sol. Shore at Mersea Island. *Festuca uniglumis* at Mersea Island is interesting, from the fact of its growing there having been recorded by Ray.

Arundo Epigejos, L. In a wood at Inworth, in several spots where the soil is strong, but rather scarce in flower.

E. G. VARENNE.

Kelvedon, Essex, April, 1852.

NOTICES OF BOTANICAL PERIODICALS, &c.

Hooker's 'Journal of Botany and Kew Garden Miscellany,' Nos. 37 and 38, January and February, 1852.

The January number contains:—‘On two new Plants found in Ceylon; by G. H. Thwaites.’ ‘Second Report on Mr. Spruce’s Collections from North Brazil; by G. Bentham.’ ‘Abstract of a Journal of the Voyage of H.M.S. Herald; by Berthold Seemann.’ ‘Tribute to David Douglas.’ ‘Sale of Nees von Esenbeck’s Library and Herbarium.’ ‘Herbarium of the late George Gardner.’ ‘Plants of Mount Olympus.’ Notices of Lanzius-Beninga’s ‘Beiträge zur Kenntniss des inneren Baues der Mooskapsel’ and Dr. Grisebach’s ‘Bericht über die Leistungen in der Geographischen and Systematischen Botanik;’ by B. Seemann.

Mr. Thwaites describes two new species—*Epicarparus Zeylanica*, *Thw.*, and *Doonia Zeylanica*, *Thw.*, and illustrates them with plates.

In Mr. Bentham’s report we meet with the following new plants:—*Salacia dulcis*, *Bth.*, *Anthodon grandiflorus*, *Bth.*, *Anthodon ? laxiflorus*, *Bth.*, *Ilex parviflora*, *Bth.*, *I. petiolaris*, *Bth.*, *Cyrtospermum gummiferum*, *Bth.* (Gen Nov. ex Ordine Terebinthacearum), *Icica Spruceana*, *Bth.*, *I. pubescens*, *Bth.*, *Hedwigia rhoifolia*, *Bth.*, *Thyrsoodium*, a new genus, closely allied to the East-Indian *Garuga*, three species of which are described—*T. Spruceanum*, *Bth.*, *T. Salzmannianum*, *Bth.*, and *T. Schomburgkianum*, *Bth.*

The portion of M. Seemann’s journal given in this number treats upon China, where the author arrived on the 30th of November, 1850. The following passages refer to the state of botany in Hong-Kong:—“There are at present two gentlemen, Dr. H. F. Hance and Lieut. Colonel Eyre, who take a deep interest in Botany. They made several excursions with me to the most profitable localities, and pointed out some of the rarest productions of the Flora. Dr. Hance was unfortunately suffering from intermittent fever, which has shaken him so much during the last four months that he will be compelled to return to

England before the commencement of the rainy season. He was therefore unable to accompany me very frequently. Lieut. Colonel Eyre makes almost daily excursions. He possesses, besides a considerable herbarium, a beautiful set of coloured drawings of Hong-Kong plants, chiefly executed by himself." We may state that both these gentlemen have now been in England for some months, and are, we are told, about to give the public the benefit of their labours.

There seems to have been a movement in favour of a botanic garden, for, "in the evening of the 2nd of December," continues the writer, "I attended a meeting of the China branch of the Royal Asiatic Society, when the Secretary read a paper by Dr. H. F. Hance, advocating the establishment of a botanical garden. It appears to be the general wish that such an institution should effect a twofold object—be useful to science, and serve as a public promenade. Yet such is the peculiarity of the ground and climate that great difficulty will be experienced in choosing an appropriate place. If a situation unprotected from the wind is selected, a single typhoon may destroy within a few hours the most valuable collection: and a sheltered position adapted for a botanical garden is hardly to be found in the vicinity of the town. Little hope remains, therefore, of seeing both objects accomplished, but, as has been observed, the advancement of science should be the primary, and promenading the secondary, aim of the institution."

In Canton M. Seemann was struck with the Chinese practice of medicine. "The people of Canton," he says, "seem to attach great value to the virtues of plants. In the principal streets are stalls where medicinal herbs, roots, barks, and other vegetable substances are sold. At one of these places I counted more than fifty different drugs. There is generally, especially if a cure is performed, a man puffing up and extolling the extraordinary properties of his wares, in doing which he indulges now and then in a piece of witticism, which occasions his gaping audience great merriment. I have never regretted so much being ignorant of the vernacular tongue as here, for whatever may be the quackery connected with the Chinese practice of medicine, a great deal, no doubt, is sound science, dearly purchased by experience. In this respect we have yet much to learn from them. The great work of Li-shi-chin, called the 'Pun-tsau-kang-muh,' or *Materia Medica*, is a valuable compilation, of which Europeans know but little, and which has never been translated into any language. It consists of no less than forty closely-printed octavo volumes, and contains several hundred figures of minerals, plants, and

animals. True, the representations are imperfect, but they are in most instances not inferior to those woodcuts adorning the pages of the old 'Kräuterbücher' and Herbals published in Europe shortly after the invention of printing. To identify the names and figures given by Li-shi-chin with scientific appellations, will be an interesting study to those who occupy themselves with Chinese Natural History, and, judging from the few extracts which have lately been published, the labour of translating the whole would be repaid by a vast amount of curious and useful information."

The article intituled 'Tribute to David Douglas' is taken from Schouw's 'Earth, Plants, and Man,' a work which belongs to the species of writing now so popular in Germany, and which had probably its origin in Humboldt's 'Cosmos.' Schleiden's 'The Plant, a Biography' (familiar to the English public through Mr. Henfrey's admirable translation), Liebig's Chemical Letters, Voigt's 'Letters on Zoology, &c.,' are publications of the same nature, all teaching science in a popular manner. In this country we have made similar attempts, but have in many cases been most singularly unsuccessful. The reason seems to be, that while our neighbours never lower the dignity of science, and rather try to raise up the mass of people to the level of philosophers, many popular writers belonging to our nation have followed a diametrically opposite course: they have deprived science of all its dignity,—of logic, of arrangement, in short, of everything that is essential to its well-being; they have created confusion where they should have cleared up mistakes.

The next article relates to the affairs of Nees von Esenbeck, with which our readers are already acquainted. M. Nees von Esenbeck is now writing his auto-biography; and we hope and trust that the ingratitude of naturalists will not form one of the closing chapters.

The February number contains the following papers:—'On the Camphor-tree of Sumatra; by Dr. W. H. de Vriese.' 'Flora Hong-kongensis; by George Bentham.' 'On the China Rice-paper Plant; by Sir William J. Hooker.' 'A new Species of Deparia; by Sir William Hooker.' 'Letter from Professor Parlatore to Mr. P. B. Webb.' 'Notes on the Botany of the Cape-de-Verde Islands; by Dr. C. Bolle.' 'On the Increase of Temperature in the Flowers of the *Victoria regia*; by Eduard Otto.' Notices of Moore's 'Popular History of British Ferns' and Seemann's 'Acacien,' two publications of which we shall have occasion to speak in another place.

In Mr. Bentham's Flora of Hong-Kong the following new plants are described:—*Androglossum reticulatum*, *Champ.* (gen. nov.), *Rhus*

hypoleuca, *Champ.*, *Crotalaria brevipes*, *Champ.*, *Indigofera venulosa*, *Champ.*, *Desniodium reticulatum*, *Champ.*, and *Lespedeza viatorum*, *Champ.*

From Sir William Hooker's account we learn that the rice-paper-plant is one of the Araliaceæ, and has provisionally, until the flowers and fruit shall have become known, been called *Aralia? papyrifera*, *Hook.*

In another article Sir William Hooker describes a new species of *Deparia*—*D. Moorii*, *Hook.*, a plant discovered by Mr. Charles Moore, in New Caledonia.

The letter of Professor Parlatore details a tour through the Scandinavian Peninsula. It is evident that the Professor, whatever he may be as a botanist, is not much of a traveller. Such passages as the following, in which he complains of the cold &c., are quite amusing; and his friends would have acted more wisely had they suppressed them. If all those enterprising men who venture into the wilds of Australia and the virgin forests of the tropics, where not one but thousands of dangers are staring them in the face, were as circumstantial in narrating the sufferings they are almost daily undergoing, we should have nothing else to listen to. "From the river Torneo I passed into the province of Muonio, and found myself in Russian Lapland, passing by Muonioniska, Karesuando, and Tubateky. Thence I penetrated into the midst of the deserts, suffering greatly from the cold, and deprived of food, or nearly so, for the plentiful supplies which I had brought with me from Stockholm had been entirely spoilt by the continual and copious rains and storms. I was in want even of bread,—exposed too, as I was, day and night to the open air without a bed, without a roof. Ah! my good friend, it is impossible for you to imagine the wretched plight I was in, the cruel privations I suffered."

Occurrence of Carex montana, L., in Gloucestershire.

By F. J. A. HORT, Esq.

I HAD the pleasure, a few days ago, of finding *Carex montana*, *L.*, growing abundantly, intermixed with *C. digitata*, *L.*, under Penmoyle Rocks, near Chepstow, on the Gloucestershire side of the Wye. It was then just coming into full flower.

F. J. A. HORT.

April 21, 1852.

PROCEEDINGS OF SOCIETIES.

Botanical Society of Edinburgh.

Thursday, April 8, 1852.—Dr. Seller, President, in the chair.

The following donations were announced to the Society's library and herbarium :—Professor Balfour's 'Class Book of Botany,' from the author; 'The Garden Companion' for March and April, from the conductor; a collection of Port-Phillip plants, from Dr. Curdie; British plants from Dr. Balfour, including *Acorus Calamus*, *Poterium muricatum*, *Anacharis Alsinastrum*, several rare species of *Potamogeton*, and other interesting plants, which he had received from Mr. Thomas Kirk, of Coventry; also *Hookeria rotulata*, from Dr. Gilbert M'Nab, of Jamaica. Thanks were voted to the various donors.

Dr. Curdie exhibited a series of beautiful specimens of Algæ, including *Rhodocallis elegans*, *Spyridia opposita*, *Laurencia papillosa*, *Plocamium costatum*, *Thamnocarpus Ptilota*; also a few Mosses. He presented specimens to the Society's herbarium.

Mr. Isaac Anderson exhibited a plant of *Rhododendron elæagnoides*, in flower, a Sikkim-Himalayan species, raised from seeds sent home by Dr. Hooker. He also showed a drawing which had been taken of the plant.

A specimen of vegetable matter, from a water-pipe passing through mossy ground, was exhibited from Dr. Douglas Maclagan, and remitted to Drs. Balfour and Greville for examination. *

Dr. Murchison exhibited some curious specimens of extract of tea, prepared in the form of lozenges by the Chinese. These lozenges were of various forms, and had impressed upon them mottoes, in Chinese characters, and the figures of different insects, musical instruments, and other objects. They had been brought from Pekin, in the year 1812, and were stated to be used by the Chinese when travelling. When introduced into the mouth they were said to dissolve slowly, preventing thirst, and proving very refreshing. Though it was forty years since they were brought from China, they still retained a very perceptible flavour of tea. Dr. Murchison presented the specimens to the Museum of Economic Botany.

Dr. Balfour exhibited the following donations, made to the Museum of Economic Botany since the last meeting of the Society :—From Michael Connel, Esq., Glasgow :—Stem of *Bambusa arundinacea*, twenty feet long and thirteen inches in circumference. From the

Caledonian Horticultural Society :—A bottle of oil expressed from the seeds of *Madia sativa*, manufactured in Holland. From Sir Graham Montgomery :—Two sections of “Queen Mary’s thorn,” from Lochleven Castle, blown down a few years ago. From Mr. Baxter, Riccarton :—Cone of the Sikkim larch, and several species of *Banksia*. From James Young, Esq. :—Scarf brought from Calabar, by Mr. Waddell, made from a species of grass. From Mr. Monro, coach-builder, Edinburgh :—A curiously-matted portion of a root, supposed to be a Scotch fir, picked up on the sea-shore near Cramond, by Miss Monro. From C. G. Scott, Esq., Malleny :—A remarkable specimen of ivy, surrounding an ash-tree. The stem of the ivy was about two feet in circumference at the lower part. From Charles Cobbold, Esq., Broughton Park :—Fruit of *Bignonia*, and a section of what he considered to be silicified wood. From Lady Harvey, Carlton Terrace :—Specimens of fossil plants (chiefly carboniferous), *Ophrys aranifera* preserved in spirits, and caterpillars of goat-moth, accompanied by the following note :—“The petrified wood was found about twenty years ago, in a sand-pit at Wodenburgh, or Woodnesborough, near Sandwich, Kent, about six miles from the sea, perforated by the *Teredo*. The *Ophrys aranifera*, found two miles west of Walmer Castle, near the sea, has been in the diluted spirits above sixteen years. *Cossus Ligniperda*, or larva of the goat-moth, perforates the trunks of many trees, particularly the oak, aspen, poplar, and willow. Of the latter we had many destroyed in our plantations by these caterpillars. They are sometimes three years in attaining perfection before they change into the pupa. They may frequently be discovered by their peculiarly disagreeable smell.” From Mr. Owen, 28, Howard Place :—A bottle of acid from the *gram* of India (*Cicer arietinum*), collected by putting a cloth over the plants, and then squeezing out the acid fluid absorbed. From Mr. Stark, 1, Hope Street :—Specimens of wood from Cornwallis Land, of great age, and so acted upon by the weather as to resemble abestus on the outside.

Dr. Balfour read a letter from Mr. Fortune, stating that he had forwarded interesting specimens of vegetable products from China, for presentation to the museum.

Mr. M’Nab read a letter from Dr. Gilbert M’Nab, of Jamaica, mentioning that he had likewise forwarded a donation of specimens to the museum.

Dr. Balfour announced that Mrs. Haig, of Viewpark, Brunsfield, had presented to the Royal Botanic Garden the magnificent collection of orchidaceous plants which she has cultivated at Viewpark for

the last fifteen years. The collection contains :—Named specimen plants, 206 ; duplicate specimens, 40 ; species without names, 83 ; —total, 329.

The following papers were read :—

1. 'On the Economic Uses of Chicory (*Cichorium Intybus*, L.) ;' by Mr. James Fulton. The author, after giving a general account of the history of the chicory-plant, and alluding to the antiquity of its cultivation, proceeded to point out the wide range of economic uses to which it might be made applicable, and urged the importance of extending its cultivation. Its extensive use as an ingredient in coffee over the whole of Continental Europe is well known. As a forage plant it is known to form some of the best meadows in the South of France and Lombardy, succeeding in all seasons ; while its use as a salad is likewise extensive. Since 1835 large quantities of the root have been imported to Britain from the Continent. It is now cultivated in several parts of England for the purpose of supplementing coffee ; and, as the plant is capable of bearing all the varieties of climate in Europe, being successfully cultivated from Italy to St. Petersburg, Mr. Fulton could see no reasonable objection to the extension of its cultivation throughout Britain, in order to supply our own markets. He stated that the popular idea of chicory giving an unpleasant flavour to coffee is erroneous, and entered into a detail of facts, to show that an admixture of chicory was a great improvement to the flavour of coffee, adducing the experience of extensive dealers to prove the accuracy of this statement. He also considered the mixture an improvement in a physiological point of view. It had occurred to Mr. Fulton that the bitter of the chicory-root might be employed as a substitute for hops ; and he had accordingly got manufactured a small brewing, which had been successful, showing that the root not only communicates a pleasant bitter, but that it likewise in some measure substitutes the malt by a large amount of saccharine matter. Mr. Fulton had found the cultivation of chicory to be very easy, and had already published his views on this part of the subject, in the 'Transactions of the Highland and Agricultural Society.' His crops had given a much larger money return than either potatoes or turnips on the same soil. It appeared to him that it was in remote districts of the country where the culture of chicory could be extensively pursued with the greatest advantage, the article being so light and convenient of transit, and free from the casualties, in all its processes of growth and preparation, which other crops are liable to, and where the risk and cost of transportation reduce so much the net

value of our bulky green crops. The paper was illustrated by an interesting series of specimens, showing the chicory in its various stages of preparation, as a substitute for coffee; also ale brewed from chicory. Mr. Fulton presented specimens of these to the Museum of Economic Botany.

2. 'Analysis of the *Sabal umbraculifera*, as grown in the Botanic Garden;' by Mr. Allan B. Dick. The following is Mr. Dick's analysis:—Organic matter: lamina, 91.90; petiole, 95.00. Inorganic: lamina, 8.10; petiole, 5.00. Silica, 37.00; sulphuric acid, 11.15; lime, 15.90; potash, 8.65; soda, 2.50; chloride of sodium, 8.45; phosphoric acid, 1.70; oxide of iron, 1.30; oxide of manganese, 1.40; magnesia, 4.75; carbonic acid, 0.99; charcoal, 5.95;—total, 99.74.

3. 'On Plants found in the Neighbourhood of Ripon, Yorkshire, in March, 1852;' by Mr. James B. Davies. After giving some particulars respecting the town of Ripon, Mr. Davies stated that the crocus, snowdrop, and laurustine were in flower in the gardens, while *Tussilago Farfara* and *Ranunculus Ficaria* were plentiful by the waysides. The yew was also in flower, as well as a number of *Salices*. He noticed two trees of the hornbeam (*Carpinus Betulus*), standing more than a foot apart from each other, which, at the height of five feet, united into one trunk, a branch from one of them being united in a similar manner. *Pyrus japonica* was observed in flower in a garden at Little Thorp, and the apricot at Ripon. *Mercurialis perennis* appeared on the 10th of March. The following wild plants were also in flower:—*Vinca major* and *minor*, *Viola odorata* and *canina*, *Adoxa moschatellina* (first seen on the 18th of March), *Glechoma hederacea*, *Veronica hederifolia*, *Potentilla Fragariastrum* (one specimen with a petal among the carpels), *Gagea lutea*, and *Primula vulgaris*. At Grantley Lodge, *Chrysosplenium oppositifolium*; and at Fountain's, *Anemone nemorosa*, with *Stellaria media* and *Lamium album*. Two miles below Ripon, *Caltha palustris* and *Petasites vulgaris* were found. Mr. Davies also found *Draba verna*, *Bellis perennis*, *Taraxacum officinale*, *Senecio vulgaris*, and *Capsella Bursa-pastoris*, all in flower. In the gardens *Cynoglossum Omphalodes*, *Narcissus Pseudo-narcissus*, and (sparingly) *Primula Auricula*. *Hottonia palustris* was found near the Yare, but not in flower.

4. 'Report on the State of Vegetation in the Edinburgh Botanic Garden, from the 10th of March till the 8th of April, 1852, as compared with the years 1850—1851;' by Mr. M'Nab.

Mr. M'Nab also laid before the meeting a record of thermometrical observations made in the Botanic Garden.

5. 'Notice of Plants found in Flower at Bowhill, Selkirkshire, on the 23rd of March;' by Dr. Balfour. *Eranthis hyemalis*, *Narcissus Pseudo-narcissus*, and *Galanthus nivalis* were abundantly in flower in the woods, probably all naturalized. *Pulmonaria officinalis*, another introduced plant, was in flower, as also *Chrysosplenium oppositifolium*, *Vinca minor*, *Petasites vulgaris* (just coming into flower), *Corylus Avellana*, *Viola odorata* (introduced), *Draba verna* (at Newark Castle), and *Mercurialis perennis*, with the flower-buds appearing. Dr. Balfour stated that, besides these plants, *Arum maculatum* occurs in the woods; also *Listera cordata* and *ovata*, *Neottia Nidus-avis*, and *Lathræa squamaria*. *Pyrethrum Parthenium* occurs at Newark Castle. *Sticta pulmonaria* was observed in immense profusion on trees on the banks of the Yarrow.

The following gentlemen were elected Fellows of the Society:—Professor Simpson, Queen Street; Major Madden, 26, Regent Terrace; and William Dumbreck, Esq., 49, Albany Street.

The Society then adjourned, to meet at the Royal Botanic Garden, on the second Thursday of May.

Linnean Society of London.

February 17, 1852.—Robert Brown, Esq., President, in the chair.

The receipt of a complete series of the publications of the Palæontographical Society, presented by the Society, was announced.

Read, the continuation of Mr. Joseph Woods' 'Notes of a Botanical Tour in France.'

Mr. Curtis called the attention of the meeting to the fact of a cavity being formed around *Soldanella alpina*, when flowering beneath the snow, as recorded by Dr. Lortet, in the 'Annals of the Agricultural Society of Lyons.' This phenomenon was referred by M. Lortet to the development of heat by the plant.

Dr. Lankester suggested that it might perhaps be owing to the absorption of heat by the dark parts of the plant.

March 2, 1852.—Robert Brown, Esq., President, in the chair.

Thomas Thompson, Esq., M.D., was elected a Fellow.

Numerous donations were announced, including several volumes of Messrs. Webb and Berthelot's work on the 'Natural History of the

'Canaries;' presented by Mr. Webb: and a collection of specimens of about 150 species of plants, from the herbarium of the late Dr. Sibthorp, either figured in the 'Flora Græca' or described in the 'Prodromus.'

Mr. Hope exhibited drawings of Australian Lepidoptera and their transformations, made from the living insects, by Harriet and Helena Scott, with descriptions by Mr. A. W. Scott, and which are intended for publication. Extracts from a notice of these drawings, by Mr. Swainson, were read by the Secretary.

Mr. Hope also exhibited a remarkably large cone of *Araucaria Bidwellii*, from Moreton Bay; and gave some interesting information relative to the dimensions attained by that tree, describing it as hardly equal in height to the Norfolk-Island pine (*Araucaria excelsa*), although in size far exceeding all other known species of the genus.

Mr. Adam White exhibited specimens of two large Hemiptera from China, lent by Mr. Fortune. The colour of one of these (the *Eurostus validus* of Dallas, when dry, was a dull brownish red, but when alive, or preserved in spirits, the most brilliant metallic grass-green: the specimens of this were both dry and in spirits. Mr. White made some observations on colour as a specific character, showing its value when derived from mechanical causes, such as the polarization of light on striated surfaces, or the filling up of cells with fluids in *Eurostus*, *Cassidæ*, *Scutelleræ*, and other insects.

Read, a further continuation of Mr. Woods' 'Notes on a Botanical Tour in France.'

March 16, 1852.—Robert Brown, Esq., President, in the chair.

Among the donations was announced a posthumous work on the Palms of British East India, from the papers of the late William Griffith, Esq., by Mr. John M'Clelland; presented by the Hon. East India Company.

Read, the conclusion of Mr. Woods' 'Botanical Notes of a Tour in France;' also a paper 'On the Habits of *Myrmica domestica*, Shuck. and on a means of applying the industry of this minute species of Ant to the preparation of skeletons of small animals,' by Mr. George Daniell.

April 6, 1852.—Robert Brown, Esq., President, in the chair.

Read, a paper by Mr. Adam White, 'On the Influence of Cold on the Flowering of Plants.' After a reference to Mr. Curtis's observations on the flowering of plants beneath the snow (made at the meeting

of this Society on the 17th of February), the author quoted some remarks from Captain Beechey's Journal, with regard to the frequent occurrence of a luxuriant vegetation under the snow in the Arctic regions. He more particularly adduced the instance of *Saxifraga nivalis*, stated by Linnæus to flower in the regions of perpetual snow. The author also offered some remarks on the modifications which the specific characters of both plants and insects undergo, when exposed to the influence of a change of climate.

Dr. Hooker mentioned that when at Tierra del Fuego he had seen *Pernettya mucronata* flowering in a spot from which the snow had been accidentally removed.

Mr. Pratt stated that at Chaumouni he had sought for plants in flower under the snow, but without success ; and he looked upon the circumstance mentioned by Mr. Curtis as an accidental occurrence.

Read also a communication from Mr. J. Mottley, of Labuan, which was accompanied by specimens of Borneo camphor, and of the tree (*Dryobalanops Camphora*) by which it was produced. This camphor is consumed chiefly in China, where it is greatly valued for its medicinal qualities. The best specimens realize £5 per pound. The oil exuding from the tree is also used in medicine and as a varnish. With the Borneo camphor are invariably mixed the red seeds of a plant, which are added by the natives under the superstitious idea that the Spirit of the camphor would fly off, unless some such inducement were offered him to remain.

On the Division of the County of Surrey into Botanical Districts, with a view to the Preparation of a Flora of Surrey. By J. D. SALMON, F.L.S., &c.

INTRODUCTION.

Physical Geography and Botanical Divisions of the County.

THE county of Surrey is situated in the south-eastern part of England. It is an inland county, bordered on the north by the river Thames, which separates it from Middlesex and Buckinghamshire ; on the east it is bounded by Kent ; on the south, by Sussex ; and on the west, by Hampshire and Berkshire.

The form or outline of the county is nearly that of an oblong quadrangle, deeply indented, however, on the north side by the winding current of the Thames, and more slightly on the west, where a branch

of the Loddon forms part of the boundary between the counties of Berks and Surrey. Its utmost length from east to west is about thirty-nine miles and a half, and its extreme breadth from north to south about twenty-five miles and a half. The area is 789 square miles; and it lies between the parallels $51^{\circ} 5'$ and $51^{\circ} 31'$ north latitude, and $0^{\circ} 3'$ east to $0^{\circ} 51'$ longitude west of Greenwich.

The surface of the county is varied and undulating throughout, the hills in some parts rising to a considerable height, and presenting very bold and commanding views. It will be found, on a general survey, that Surrey presents as great a variety of scenery as any county in the kingdom. In some parts the naked heaths impart a wildness to the prospect, which is strikingly contrasted with the numberless beauties scattered over the face of the county by the hand of art; while the hills, aspiring to the bold character and picturesque scenery of mountains, gradually decline into richly-wooded dales, and plains in a high state of cultivation.

Geologically considered, the strata of the county of Surrey constitute three principal groups, namely:—*First*, the wealden and iron-sand formation, which is the lowermost and most ancient series of deposits in the county (the latter only just appears at the south-eastern corner of the county), forms the whole of the southern border of the county, except a very small part west of Haslemere. The wealden clay occupies a broad valley at the foot of the greensand hills, and in some parts forms the lower portion of the south side of the hills. The extent of this formation to the east constitutes an area of eight or nine miles across; but towards the west it is contracted to about three miles. *Secondly*, the chalk and greensand, which is superimposed thereon, the latter formation running parallel with the northern margin of the wealden clay, and traversing the county from the east, where its width does not exceed from two to two and a half miles across, to the south-west, where the area is of considerable extent, being from nine to ten miles across. The area of the chalk on the eastern side of the county is from eight to nine miles, and extends by Godstone into Kent, where the range is called the North Downs, and terminates in the cliffs of Dover; but towards the west it is contracted into that narrow but beautiful ridge called the Hog's-back, which for six or seven miles scarcely exceeds half a mile in breadth; the whole occupying the central portion of the county from the east to the south-west. And *Thirdly*, the London clay, or tertiary beds, distributed in basins, or depressions of the chalk, upon the last-named strata. There are here and there accumulations of ancient drift, consisting of loam,

gravel, and sand, which are designated *diluvium*. The area occupied by these deposits is designated the London Basin, and is of considerable extent, occupying the whole of the north and north-western division of the county, and varies from ten to twelve miles across from north to south.

Rivers.—The county is included in the basin of the Thames, except three very small portions, two south of the greensand hills, which are drained by streams flowing into the Arun, and a third in the south-east corner of the county, which belongs to the basin of the Medway. Independently of the river Thames, there are three principal rivers (besides some smaller streams) which properly belong to Surrey, namely:—1st. The Wey, which rises near Alton, in Hampshire, and enters the county at Farnham, whence it flows with many bends, receiving in its course several small streams, by Godalming to Guildford, where it passes through the chalk ridge towards Weybridge, below which it enters the Thames; the whole length being about forty-one miles, for about eighteen of which it is navigable. 2nd. The Mole, which rises in the northern part of the county of Sussex, near Hand Cross, and enters this county at various places on its south and south-eastern confines: several of these branches congregate near Gatwick, in this county; and then, passing Horley, the united stream runs northward to Kinnersly Bridge, receiving in its course a considerable accession from various sources, till it reaches Betchworth and Box Hill, at the base of which it penetrates through the chalk range of the North Downs; thence it passes by Leatherhead, and enters the Thames at East Moulsey, opposite Hampton Court. Its whole course may be estimated at forty-two miles. It is not navigable in any part. 3rd. The Wandle, which rises near Croydon. It takes its course westward by Beddington to Carshalton, and thence runs northward by Mitcham and Merton, and passes on to Wandsworth, where it unites with the Thames. Its course is only eleven miles, and is not navigable. Besides the rivers which have been described, there is a stream called Bourn Brook, which rises near Bagshot, and flows by Chobham and Addlestone into the Thames below Chertsey. Its whole length is about fourteen or fifteen miles. There is also a small stream called Hogg's-mill river, which rises in a copious spring in the village of Ewell, and flows north-west seven miles into the Thames at Kingston. The stream which enters the Thames near Putney rises at the foot of Banstead Downs, near Cheam. Its length is almost ten miles. None of these are navigable.

1. *North-eastern Division.*

The north-eastern division has the river Thames for its north and north-western boundary to Kingston, and thence by the turnpike-road to Ewell, which forms the western. The southern is continued by the turnpike-road from Ewell, running through Cheam and Carshalton to Croydon, and thence to the borders of Kent, which furnishes the eastern boundary, including an area of about ninety-seven square miles.

The whole of this division, with the exception of a narrow slip of the chalk on the southern boundary, in the vicinity of Cheam, Sutton, &c., belongs to the London-clay formation, and is comparatively low. The various elevations on the north side, as Denmark Hill, Herne Hill, Richmond Hill, &c., although of no great height, still command some extensive prospects. It also forms the hills running southward along the Kentish border from New Cross, Forest Hill, Sydenham, and Norwood, where the hills attain an elevation of 389 feet above the level of the sea. The northern portion from New Cross to Battersea is covered with alluvium, as is the case along the river between Putney and Richmond. It is estimated that in some situations the total thickness of the clay is nearly 1000 feet, whilst that portion which extends into Surrey does not exceed from 500 to 600 feet.

This division is principally drained by the river Wandle, and by two other minor streams—the Hogg's-mill River and the stream which joins the Thames near Putney.

2. *Eastern Division.*

The eastern division is bounded on the north by the turnpike-road leading from Croydon, through Carshalton and Cheam, to Ewell, which separates the north-eastern division. The western boundary, commencing from Ewell, is continued on by the turnpike-road to Epsom, and thence towards Reigate to its junction with the Reading and Reigate Railway. The southern limit is formed by the continuation of the railway to the junction, and thence by the road leading through Bletchingly and on to the borders of Kent, the latter constituting the eastern boundary. Its area is almost ninety-five square miles.

The entire division is occupied by the chalk formation. The chalk, as seen by the map, occupies a considerable area, and is a portion of the North Downs. On the north side of this range several layers of the plastic clay occur, and are seen cropping out from beneath the London clay at Ewell. On the south side a terrace of considerable

breadth, at the foot of the escarpment of this range, extending from Godstone by Merstham, Reigate, and through the county into Hampshire, defines the geographical range and extent of the firestone. At Merstham it is well developed. "The church stands upon a mound, or hillock, of this rock, from the base of which a spring gushes out immediately beneath the firestone." The galt forms a corresponding narrow depression along its whole length, and is seen to emerge on the surface from under the firestone, forming a belt of stiff soil, which may be traced by Bletchingly, Merstham, and Reigate. The remaining part of this division forms a small portion of the lowermost group of the chalk formation, that important and extensive series of arenaceous strata, for which the term lower greensand is employed, which rise into a range of hills, running parallel with the southern escarpment of the North Downs. The district yielding fuller's earth hitherto explored, is about two miles in length from east to west, and a quarter of a mile in breadth. The little village of Nutfield has long been celebrated for this mineral, which has for centuries been dug in its neighbourhood.

The view from the summit of the chalk-hills to the north of Reigate is as interesting to the geologist as to the lover of the picturesque, for it presents a magnificent landscape, displaying the physical structure of the weald, and its varied and beautiful scenery.

From the porous nature of the chalk-hills they are uniformly dry, permitting the free passage of the rain-water; so that there is almost a total absence of surface-drainage. From the galt that forms the foundation of the chalk-hills numerous springs and rivulets issue, which unite and form the river Wandle.

3. South-eastern Division.

The south-eastern division has its northern boundary defined by the road from Westerham, passing by Limpsfield, through Bletchingly, to the railway at the Reigate junction, and thence by the Reading and Reigate Railway to the Dorking station. The western boundary is continued thence through Dorking, by the turnpike-road leading towards Horsham; the counties of Sussex and Kent respectively forming the southern and eastern boundaries. The area is about one hundred and nineteen square miles.

With the exception of a narrow strip of the lower greensand running along the northern boundary, the whole of this division is of the wealden-clay formation. A stiff blue clay invariably appears, and forms the subsoil of the district to its junction with the adjacent

county of Sussex. The iron-sand only just appears at the south-eastern corner of this division.

The eastern portion of this division lies in the valley of the Medway, and is drained by a considerable branch of that river, which rises in the parishes of Godstone and Horne, and, passing through the parish of Lingfield, quits Surrey, and enters Kent. The remainder of the division is drained by the various tributaries to the Mole, which river falls into the Thames.

4. *Northern Division.*

The northern division has the river Thames, from Kingston to Weybridge, for its northern boundary, and thence for its western the canal to Newark Mill; the south, by Ockham Common to Cobham Court, and the river Mole to Leatherhead. The turnpike-road thence through Epsom and Ewell to Kingston constitutes the eastern boundary; the area occupying about sixty-one square miles.

The principal feature of this district is the London clay, portions of which are covered with the Bagshot sand, as in the vicinity of Kingston, Esher, and the western side, where it attains considerable elevation, as at St. George's Hill.

This division is drained by the rivers Wey and Mole.

5. *Central Division.*

The central division has a portion of its northern boundary defined by the turnpike-road from Epsom to Leatherhead, and the remainder by the river Mole, thence to Cobham Court, and continued onwards by Newark Abbey to the river Wey, the latter constituting the western boundary to its junction with the Reading and Reigate Railway at Shalford, whence the Railway to Reigate forms the southern, and the turnpike-road thence to Epsom the western, boundaries. The area is about eighty-seven square miles.

This division is principally occupied by the chalk, which constitutes the entire breadth of its eastern boundary, and gradually narrows towards Guildford. The surface, where not altered by cultivation, is covered with a short, verdant turf. The whole range presents to the south a bold escarpment, from which some magnificent views are obtained over the weald. That portion of the greensand which runs along the southern boundary rises in considerable elevations; and at St. Martha's the sand rises with such rapidity, that it equals or out-tops the chalk. The north-west portion of this division is covered with the London clay.

From the porous nature of the chalk there is but little surface-drainage, and that is supplied by the Mole and the Wey, which pierce the chalk.

6. *Southern Division.*

The southern division has the Reading and Reigate Railway for its northern boundary. The Wey and Arun canals form the western, the county of Sussex the southern, and the turnpike-road from the direction of Horsham to Dorking, which also separates this division from the south-eastern, constitutes the eastern boundary. The area is about seventy-six square miles.

This division is about equally divided between the lower greensand and the wealden clay. The former, occupying the northern portion, presents a series of barren wastes, which towards the south rise into the bold and mountainous ridge of Leith Hill, which is 993 feet above the level of the sea. The latter presents a uniform elevation of surface, covered with extensive woods and coppices.

This division is drained by various small tributary streams of the river Wey.

7. *North-western Division.*

The north-western division is bounded on the north-east by the river Thames from Weybridge, and terminates at Runnymede; on the south-west, by the county of Berkshire; west, by the county of Hampshire, to the South-Western Railway; south and south-east, by the Basingstoke Canal to Weybridge; the area being about seventy-six square miles.

The whole of this division is of the London-clay formation, the greater portion being covered with the Bagshot sand, which belongs to the upper marine formation, and presents a poor, hungry, unimprovable soil. Hence extensive barren heaths and wastes occur throughout. This stratum forms, or covers, several eminences, as Crawley Hill (west of Chertsey) and Bagshot Heath, and the high grounds of Chobham Ridges. The greatest elevation does not exceed 463 feet above the level of the sea. Large masses of siliceous sandstone, occurring in loose blocks, and called *gray withers*, are found on Bagshot Heath.

The principal portion of this division is drained by the Bourn Brook, which enters the Thames below Chertsey.

8. *Western Division.*

The western division has the Basingstoke Canal, commencing from its junction with the Wey Canal, for its northern boundary. Whilst the border of Hampshire to Farnham constitutes its western, the southern is defined by a road running at the foot of the Hog's-back, on the south side, from Farnham through Seale and Puttenham to St. Catherine's Ferry; and the eastern, by the river Wey to the junction with the Basingstoke Canal. The area of this division is about sixty-five square miles.

This division is principally occupied by the London clay, the northern portion being covered with the Bagshot sand, which is a continuation from the north-western division. The greatest elevation does not exceed 500 feet, as at Tuckbury Hill and Bacon-hill Camp, north of Farnham. Beds of peat exist in the parishes of Ash, Worplesdon, and Pirbright. At the latter place the peat-moss is from twelve to fourteen feet deep. There is a narrow ridge of chalk running almost the whole length of the southern boundary, called the Hog's-back, which scarcely exceeds half a mile in breadth, and commands a most extensive prospect; at the foot, on the south side of this remarkable ridge, there is a narrow stratum of firestone, which forms a slight projection, and the gale a corresponding depression, along its whole length, varying in breadth from a few hundred yards to a quarter of a mile.

The whole division is drained by the various tributaries to the Wey, which forms the principal boundary to the eastward.

9. *South-western Division.*

The south-western division is bounded on the north, commencing from St. Catherine's Hill, by a road thence in the direction of Losely, at the foot, on the south side of the Hog's-back, through Puttenham and Seale to Farnham; the western, by the county of Hampshire; the southern, by the county of Sussex to the Wey and Arun Canal, the latter forming the eastern boundary, to the ferry at St. Catherine's. The area is about one hundred and thirteen square miles.

With the exception of the wealden clay, which occupies the south-eastern part, the principal stratum in this division forms a considerable portion of one of the most extensive surfaces of the greensand in England; and its general thickness may be estimated at 350 to 400 feet. The extensive heaths which prevail in this division are wild and barren in their aspect, and destitute of wood. On the south

the ground rises rapidly towards Hind-head, where an elevation of upwards of 900 feet above the level of the sea is attained; the ascent consisting of sand deeply trenched into channels. Here is a remarkable depression, called the *Devil's Punchbowl*; and on Frensham Common there is a conspicuous group of barren, somewhat conical hills, called the *Devil's Jumps*. The scenery in this neighbourhood is wild, and the soil barren in the extreme; the surface is, in fact, to this hour, nearly such as it may be conceived to have been when first uncovered by the departure of the sea. The whole division is intersected with delightful valleys.

There are some extensive ponds in this division, the principal one being Frensham Great Pond, which occupies about 150 acres. The whole district is drained by the various tributaries to the river Wey.

J. D. SALMON.

Observations on the Teas of Commerce.

By R. WARINGTON, Esq., F.C.S.*

IN my previous communication to the Society on this subject, in February, 1844,† I endeavoured to show that there exist two distinct kinds of green tea, known in commerce as *glazed* and *unglazed*; that the former is coloured by the Chinese with a mixture of Prussian blue and gypsum, to which a yellow vegetable colouring matter is sometimes added, while the latter are merely dusted with a small quantity of gypsum; that in the specimen of the so-called Canton gunpowder, this glazing or facing is carried to the maximum. I also mentioned, that I had never met with a sample of green tea in which the blue tint was given by means of indigo. Since the publication of that paper, I have been in communication with several parties of great experience in this subject, from whom I have received much additional information, which, with several experimental points of interest that have come under my own immediate observation, will form the subject of the present paper.

The first point to which I wish to call the attention of the Society is, the question of the blue colouring matter used by the Chinese for

* Read at the Chemical Society, May 19, 1851, and printed in their Quarterly Journal, vol. iv. p. 156.

† 'Memoirs and Proceedings of the Chemical Society,' ii. 73; (Read February 5, 1844).

colouring the green teas being Prussian blue, because some doubts have been thrown on this subject from various quarters. Mr. Bruce thus states :*—"The Chinese call the former (the indigo) *Youngtin*, the latter (the sulphate of lime) *Acco*." Now I am favoured with the opinion of Mr. J. Reeves on this point, whose knowledge and experience render him most competent to decide in such a case ; he believes that indigo is *never* employed for the colouring used on tea, that the term *Youngtin*, as used by Mr. Bruce, should be *Yong-teen*, *foreign blue*, the name given by the Chinese to Prussian blue in contra-distinction to *Too-teen*, *native blue* or *indigo*. This, I think, is very conclusive evidence, and shows that Mr. Bruce's statement was erroneous.

In another quarter a surmise has also been published on this same point. Mr. Fortune, in his entertaining work on China,† says, speaking of the ingredients used in dyeing the northern green teas for the foreign market, p. 201, "There is a vegetable dye, obtained from *Isatis Indigotica*, much used in the northern districts, and called *Tein-ching*, and it is not unlikely that it may be the substance which is employed ;" again, at p. 307, "I am very much inclined to believe that this (the *Tein-ching*) is the dye used to colour the green teas which are manufactured in the north of China, for the English and American markets." This question, however, I think, is now satisfactorily settled, and the experimental evidence I had adduced of the material being Prussian blue of a darker or paler tint, placed beyond a doubt by a positive demonstration ; for Mr. Fortune has forwarded, from the north of China, for the Industrial Exhibition, specimens of these materials, which, from their appearance, there can be no hesitation in stating are fibrous gypsum (calcined), turmeric root, and Prussian blue ; the latter of a bright pale tint, most likely from admixture with alumina or porcelain-clay, which admixture may account for the alumina and silica found as stated in my previous paper, and the presence of which was then attributed possibly to the employment of kaolin or agalmatolite.

Mr. J. R. Reeves, in a letter to my friend, Mr. Thompson, dated July 1, 1844, commenting on my paper, says :—"Mr. Warrington's experiments have led him to correct results as to the substances used, which I know to be Prussian blue, gypsum (fibrous), and turmeric ; the second being sulphate of lime ; and the last, the 'yellow or

* 'Report on the Manufacture of Tea, &c.,' by C. A. Bruce, August 16, 1839.

† 'Three Years' Wanderings in the Northern Provinces of China,' by Robt. Fortune.

orange-coloured vegetable substance,' which Mr. W. does not otherwise name. That the colouring is not intended as an adulteration, I feel quite sure. It is given to suit the capricious taste of the foreign buyers, *who judge of an article used as a drink by the eye instead of the palate*. You well know how little the London dealers, even now, like the yellowish appearance of uncoloured green tea. The Americans, a few years since, carried the dislike even further than the English, and therefore the Chinese merchant had scarcely a chance of selling his tea unless he gave it a 'face' that would suit *their fancy*. The small quantity of the colouring matter used, must preclude the idea of adulteration as a matter of profit." Mr. J. Reeves states, "that in the East India Company's time, gypsum and Prussian blue were sometimes used upon hyson teas, Tien Hing using the first on his pale, bright hyson; Lum Hing, the latter on his dark, bright leaf; but these were only in minute quantities, just sufficient to produce an uniform face."

It is still a question of interest, which I before alluded to, whether the gypsum, in its *calcined* state, is not used for the absorption of the last portions of moisture, and allowing the tea the better to withstand the damp of the sea voyage. Through the kindness of Dr. Royle, I have received, since my last communication, a sample of green tea from the Kemaon district, in the Himalayas, which is quite free from any facing, as are also the green teas of Java, a large number of which I have had the opportunity of examining, and which are exceedingly clean and genuine in their appearance and characters.

On Black and Green Teas.

Although the preparation of green and black tea from the respective plants, the *Thea viridis* and the *Thea Bohea*, has been warmly advocated by many botanists, yet it is now, I believe, pretty generally admitted by all parties, that both green and black teas can be and are made indiscriminately from the same parcel of leaves, taken from the same species of plant. It is also well known to all persons, that the infusions from these teas have marked differences of colour and of flavour, and that the effects produced on some constitutions by green tea, such as nervous irritability, sleeplessness, &c., are very distinct from those produced by black tea. Their characteristic physical differences are too well known to require any comment, but they have peculiar chemical qualities to which we shall have occasion to allude more particularly presently, and which have always been attributed by chemists to the effect of high heat in the process of manufacture.

The question presents itself, then,—From whence do these distinguishing peculiarities arise, and to what are they to be attributed? From observations made in other directions, in the course of the routine work of the establishment to which I am attached, I had formed in my own mind certain conclusions on this subject. I allude to the exsiccation of medicinal herbs; these are for the most part nitrogenous plants, as the *Atropa Belladonna*, the *Hyoscyamus niger*, the *Conium maculatum*, and others. The plants are brought to us by the growers or collectors from the country, tied up in bundles; and when they arrive fresh and cool they dry of a good *bright green* colour; but, on the contrary, it is found that if they are delayed in their transit, or remain in a confined state for too long a period, they become heated, from a species of spontaneous fermentation, and when loosened and spread open emit vapours, and are sensibly warm to the hand; when such plants are dried, the whole of the *green colour* is found to have been destroyed, and a *red-brown* and sometimes a *blackish-brown result* is obtained. I had also noticed that a clear infusion of such leaves evaporated carefully to dryness was not *all* re-dissolved by *water*, but left a quantity of *brown, oxidised, extractive matter*, to which the denomination *Apothem* has been applied by some chemists; a similar result is obtained by the evaporation of an infusion of black tea. The same action takes place by the exposure of the infusions of many vegetable substances to the oxidising influence of the atmosphere; they become darkened on the surface, and this gradually spreads through the solution, and on evaporation the same *oxidised extractive matter* will remain insoluble in water. Again, I had found that the green teas, when wetted and re-dried, with exposure to the air, were nearly as dark in colour as the ordinary black teas. From these observations, therefore, I was induced to believe that the peculiar characters and chemical differences which distinguish black tea from green, were to be attributed to a species of heating or fermentation, accompanied with oxidation by exposure to the air, and not to its being submitted to a higher temperature in the process of drying, as had been generally concluded. My opinion was partly confirmed by ascertaining from parties conversant with the Chinese manufacture, that the leaves for the black teas were always allowed to remain exposed to the air in mass, for some time before they were roasted. Mr. Ball, in his valuable work on the manufacture of tea,* has described in detail the whole routine of these interesting processes, fully

* 'An Account of the Cultivation and Manufacture of Tea in China,' by Saml. Ball, Esq.

confirming my preconceived opinions, and of which I cannot do better than give a summary. Some of the facts, I believe, had been published in Batavia, in 1844, by Mr. Jacobson,† in the Dutch language. In the preface to his work, Mr. Ball says :—“ It will be seen by dates incidentally adverted to, that the facts and most of the materials of this work, were established and collected thirty years ago.”—“ These facts, as well as other materials, were derived from conversation with growers and manipulators from the tea districts ; from written documents furnished by Chinese ; from published works in the same language diligently sought out ; and also from correspondence with a Spanish missionary long resident in the province of Foken. These were all put into their present form full twenty years ago, and were read to one or two friends during my residence in China.”—“ They were not, however, so arranged, with any view to immediate publication.”—“ They were thus disposed as the best mode of recording and keeping together, the facts and materials I had collected.”—“ But it was not till the year 1844, when I received Mr. Jacobson’s Handbook on the cultivation of tea in Java, that I found my own views so far confirmed, and my information such as to justify me in bringing my labours to a close.”

The processes peculiar to the preparation of black tea, are styled Leang-Ching, To-Ching, and Oc-Ching, and these all consist in carefully-watched and regulated processes of *spontaneous heating* or *slow fermentation* of the leaves until a certain degree of fragrance is developed. The leaves are said to *wither and give*, and become soft and flaccid. The utmost care, practical skill, and experience is required in the properly conducting these operations, and as soon as the proper point is arrived at, the leaves are to be immediately removed to the Kuo or roasting-pan. After being roasted and rolled two or three times, they are then to be dried, and this is effected in the Poey-long, which consists of a cylinder of basket-work, open at both ends, and covered on the outside with paper ; it is about $2\frac{1}{2}$ feet in height and $1\frac{1}{2}$ in diameter, which diameter is diminished in the centre, like an ordinary dice-box, to one foot and a quarter. This stands over and round a small charcoal fire, and is supplied with cross-bars about fourteen inches above the fire, on which an open sieve containing the tea is placed ; and a small aperture about an inch and a half in diameter is made in the centre of the tea with the hand, so that an ascending current of air and the products of the combustion pass

† ‘ Handbook v. d. Kult. en Fabrik v. Thee.’

through and over the tea contained in the sieve. A circular, flat, bamboo tray is placed partially over the mouth of this cylinder, and most probably serves to regulate the rapidity of the ascending current, prevent the admission of the cold air to the leaves, and at the same time allow a sufficient outlet for the generated watery vapours and the products of combustion. At the commencement of this operation, the moist leaves are still green, and retain their vegetable appearance; after the drying has continued about half an hour, the leaves are turned, and again submitted to the heat for another half-hour; they are then taken out, rubbed and twisted, and after sifting away the small dust, again returned to the sieve and drying-tube. This operation of sifting is very necessary, to remove any of the small tea or dust which might otherwise fall through the meshes of the sieve on to the fire, and the products of their combustion would deteriorate and spoil the flavour of the tea. The leaves have now begun to assume their black colour; the fire is diminished or deadened by ashes; and the operation of rolling, twisting, and sifting is repeated once or twice until they have become quite black in colour, well twisted, and perfectly dry and crisp. They are then picked, winnowed, and placed in large quantities over a very slow fire for about two hours, the cylinder being closed.

Now, that this black colour is not owing to the fire is evident; for in cases mentioned by Mr. Ball, where the leaves have been dried in the sun, the same colour is obtained; and, on the other side, if roasted first, without the process of fermentation or *withering*, and then finished in the Poey-long, a kind of green tea is produced.

In the operations for the manufacture of green tea, on the contrary, the freshly-picked leaves are roasted in the Kuo at once, without delay, at a high temperature; rolled and roasted again and again, assisted sometimes with a fanning operation to drive off the moisture, and always with brisk agitation until the drying is completed.

The marked differences in the mode of manufacture of black and green tea, will, I consider, after what has been stated, fully account for all the variation of physical and chemical properties to which I have before alluded.

Adulteration and Sophistication of Teas.

Since writing my former paper, several teas have come under my notice, which must be classed under this head. The first I shall mention is a sophistication which has been carried on in this country to some extent, and consists in giving the appearance of green tea to

an imported black tea. The material used as the basis for this process of manufacture is tea called scented caper; it is a small, closely-rolled black tea, about the size of small *gunpowder*, and when coloured is vended under this latter denomination, the difference in price between the scented caper and this fictitious gunpowder being about 1s. per lb., a margin sufficient to induce the fraud. This manufacture has been carried on, I understand, at Manchester, and was kept as secret as possible; and it was only after considerable trouble that some of my friends succeeded in obtaining two different specimens for me, that could be fully depended on, as originating in this manufactory. It appears that it is generally mixed with other tea, so as to deceive the parties testing it. How this manufacture was conducted, I am not prepared to say; but some preparation of *copper* must have been employed, as the presence of that metal is readily detected in the specimens I received. I believe, however, that this sophistication has ceased.

I have now to call attention to another adulteration of the most flagrant kind. Two samples of tea, a black and a green, were lately put into my hands by a merchant for examination, the results of which he has allowed me to make public. The black tea was styled *scented caper*; the green, *gunpowder*; and I understand they are usually imported into this country in small chests called catty packages. The appearance of these teas is remarkable; they are *apparently* exceedingly closely rolled, and very heavy; the reasons for which will be clearly demonstrated. They possess a very fragrant odour. The black tea is in compact granules, like shot of varying size, and presenting a fine glossy lustre of a *very black* hue. The green is also granular and compact, and presents a bright pale-bluish aspect, with a shade of green, and so highly glazed and faced, that the facing rises in clouds of dust when it is agitated or poured from one vessel to another; it even coats the vessels or paper on which it may be poured. On examining these samples, in the manner described in my former paper, to remove this facing, I was struck by the tenacity with which it adhered to the surface, and which I had never remarked in any previous sample, requiring to be soaked for some time in the water before it could be detached; with this precaution, however, the greater part of the facing material was removed. It proved, in the case of the sample of green tea, to be a pale Prussian blue, a yellow vegetable colour, which we now know to be turmeric, and a very large proportion of sulphate of lime. The facing from the sample of black tea was *perfectly black* in colour, and on examination was found to

consist of earthy graphite or black lead. It was observed, that during the prolonged soaking operation, to which these teas had been submitted, there was no tendency exhibited in either case to unroll or expand, for a reason which will be presently obvious. One of the samples was therefore treated with hot water, without, however, any portion of a leaf being rendered apparent. It increased in size slightly, was disintegrated, and then it was found that a large quantity of sand and dirt had subsided; this was separated by decantation, and collected; it was found to amount to 1·5 grains from 10 grains of the sample, or 15 in the 100 parts. It was evident, however, that much of the lighter particles must necessarily have been lost in the process of decantation; a weighed quantity of the sample was therefore carefully calcined, until the ash was quite white, and the whole of the carbonaceous matter burnt off; it yielded a result equivalent to 37·5 on the 100 parts. During this operation also, no expansion or uncurling of the leaf, as is generally to be observed when heat is applied to a genuine tea, was seen; in fact, it was quite evident that there was *no leaf to uncurl*, the whole of the *tea* being in the form of dust. The question next presented itself as to how these materials had been held together, and this was readily solved; for, on examining the infusion resulting from the original soaking of the sample, abundant evidence of gum was exhibited.

The sample of green tea was of a precisely similar kind to the black; it yielded 4·55 grains of ash, &c., from 10 grains of the specimen, or 45·5 per cent. A specimen of Java gunpowder yielded 5 per cent. of ash; so that we have in this sample 40·5 per cent. of dirt and sand over and above the weight of ash yielded by the incineration of a genuine tea.

Thus we have, then, in these samples a mixture of tea-dust with dirt and sand, agglutinated into a mass with gummy matter, most probably manufactured from rice-flour, then formed into granules of the desired size, and lastly dried and coloured, according to the kind required by the manufacturer, either with black lead, if for black tea, or with Prussian blue, gypsum, or turmeric, if intended for green.

Since examining these two samples, I have obtained through a friend another specimen of green tea, having a very different appearance; that is, better manufactured, or rather, I should say, more likely to deceive the consumer, from its being made to imitate an *un-glazed tea*. It is of a yellowish-green colour, scented and granulated as the former samples, and not much dusted; it yielded 34 per cent. of ash, sand, and dirt.

On inquiry, I have learnt that about 750,000 lbs. weight of these teas have been imported into this country within the last eighteen months, their introduction being quite of modern origin; and I understand that attempts have been made to get them passed through the Customs as *manufactured goods*, and not as teas; a title which they certainly richly merit, although it must be evident, from a moment's consideration, that the revenue would doubtless be defrauded, inasmuch as the consumer would have to buy them as teas from the dealer. It is to be feared, however, that a market for them is found elsewhere. The Chinese, it appears, will not sell them except as teas, and have the candour to specify them as *Lie* teas; and if they are mixed with other teas of low quality, the Chinese merchant gives a certificate, stating the proportion of the *Lie tea* present with the genuine leaf. This manufacture and mixing is evidently practised to meet the price of the English merchant. In the case of the above samples, the black is called by the Chinese *Lie-flower caper*; the green, *Lie gunpowder*; the average value is from 8d. to 1s. per lb. The brokers have adopted the curious term *gum and dust*, as applied to these *Lie* teas or their mixtures, a cognomen which at first I had some difficulty in understanding, from the rapid manner in which the two first words were run together.

I may subjoin the results obtained from the careful incineration of a variety of teas, as they may be interesting, for the purpose of comparison, and illustrate the point I have mentioned as to these spurious teas being mixed with genuine ones.

Quantity of Ash in 100 parts of each of the following Teas :—

	<i>Grains.</i>
Gunpowder tea made in Java	5·0
Gunpowder, during the East India Company's Charter	5·0
Kemaon hyson	6·5
Assam hyson	6·0
Lie gunpowder, No. 1	45·5
" No. 2	34·0
Scented caper	5·5
Lie-flower caper	37·5
Mixtures containing these Lie teas, No. 1	22·5
" " No. 2	11·0

ROBERT WARINGTON.

Spices, and their Importation into Great Britain.

SCHLEIDEN has declared that professional vanity induced him to write his work, 'The Plant;' that he wanted to dispel the popular notion that a botanist was merely a man who dried herbs, and afterwards named this artificial hay. We wish that sort of vanity would spread; but unfortunately the great mass of botanists fully deserve the estimate in which they are held, for whenever there is any chance to show the practical application of their science, by solving some question of general interest, no one stirs. Nutmegs and other spices have lately caused a discussion in this country; yet no naturalist has taken a part in it; and had it not been for one of the daily papers it would not have been settled. In transferring, therefore, the following valuable extracts to the pages of our journal, we do it not without blushing, because we feel that our botanists have been guilty of neglect.

"It appears from the public accounts of 1851," says the 'Daily News,' "that the total gross revenue derived from spices in that year amounted to £117,768, and was levied on 4,220,399 lbs. of spices of all kinds. A general reflection obtrudes itself on considering this fact. Spices evidently belong to that category of commodities, which the financiers who recommend the concentration of Customs' imposts on a few articles of universal and extensive consumption would strike out of the Customs' tariff altogether. The revenue derived from them scarcely compensates the increased annoyance to trade and the increased expense of the Customs' establishment, which the multiplication of duty-paying commodities occasions. On the other hand, spices being, although wholesome, not an article of prime necessity, are fair objects of taxation. The reasons for and against retaining them on the Customs' tariff are pretty equally balanced. But if they are retained the assessment of duties levied on them ought clearly to be as equitable and as little embarrassing as possible. Unfortunately, however, the tariff of duties on spices is most unequal and anomalous, and clearly assessed upon no fixed principle.

"We begin with pepper. This is emphatically the poor man's spice, being the only one within reach of his narrow means, and largely consumed by the less wealthy classes. Of the 4,220,399 lbs. of spices taxed in 1851, no less than 3,303,402 were pepper; and of the £117,768 of revenue derived from spices, £86,729 were levied upon pepper. The average price of black pepper (white pepper is merely the fruit of the same plant, with the flesh removed by washing, and much

less generally used) is 4*d.* per lb., and the duty imposed upon it is 6*d.* per lb., being an *ad valorem* rate of 150 per cent. This is twice as high as the rate levied on cloves, more than twelve times as high as that levied upon cinnamon, and twenty-four times as high as that levied upon cassia—all of which are mere luxuries, and exclusively consumed by the more wealthy. This is unjust, and, like all injustice, detrimental. Before 1826 the duty on pepper was 2*s.* 6*d.* per lb., and the annual consumption 1,450,000 lbs. In that year the duty was reduced to 6*d.* per lb., and in 1837 the annual consumption had risen to 2,625,975 lbs. During the 14 years which had since elapsed there has been a further increase of about 20 per cent.; but this increase must obviously be accounted for by the advance of population. It is, therefore, apparent that the duty is still so high as to restrict consumption and diminish revenue. Pimento, a West-Indian product, is in less demand than black pepper. The quantity of it taken for home consumption last year was only 440,720 lbs. Its price in bond is 4½*d.* per lb., and, at 5*s.* per cwt., the duty per lb is about ½*d.*; or but little more than one-twelfth part of the duty on pepper. No reasonable ground can be conceived for subjecting the two articles to such different rates of duty. Even a West Indian may see that it has not induced the people of this country to substitute pimento for black pepper. Cassia and cinnamon, though distinct species of the same genus of plants, if considered as condiments, are of the same nature. Cassia is almost exclusively the produce of China, while cinnamon consumed in Europe comes from our possessions in Ceylon. Last year 82,467 lbs. of cassia were consumed in this country, and 39,582 lbs. of cinnamon; the duty paid on the former was £1,078, on the latter £542. The average price of cassia is 1*s.* per lb., of cinnamon 1*s.* 9*d.*; the duty on cassia is 1*d.* per lb., on cinnamon 3*d.* In other words, the *ad valorem* duty on cinnamon is nearly double that on cassia. This anomaly is inapplicable even on protectionist principles; it is, in fact, a protection for the foreigner against British subjects. In 1851 the duty on 138,131 lbs. of cloves amounted to £3,626. The best cloves are imported from the Dutch settlements in the Molucca Islands and Bencoolen, and the British settlement of Penang; the worst from the French colonies of Bourbon and Cayenne. At present Amboyna and Bencoolen cloves are quoted at 14*d.* per lb., those of Cayenne and Bourbon at 6½*d.* Taking 8*d.* as the average, the tax on the value of the whole cloves imported (6*d.* per lb.) is 78 per cent.; but on the worst cloves it is 92 per cent., while on the best it is little more than 42 per cent. Of nutmegs the quantity taken for

home consumption last year was 194,132 lbs.; the amount of duty paid on them was £21,913. In our Customs' tariff there are two distinct rates of duty on nutmegs: 5*d.* per lb. on what are called 'wild nutmegs' and 2*s.* 6*d.* on 'all other nutmegs.' Now the fact is, though the Boards of Trade and Customs cannot or will not be made to understand it, that there is no such thing as a wild aromatic nutmeg. All the nutmegs of commerce are of one, and that of a cultivated species. It so happens, however, that some nutmegs are round and others oblong, though both are produced from the same species of plant, both cultivated in the same gardens, and both sold for the same price in the English market. Our Custom-house has, notwithstanding, decided that all nutmegs of a roundish form shall be called cultivated nutmegs, and subject to a duty of 2*s.* 6*d.* per lb., while all of longish form shall be called 'wild,' and subject only to a duty of 5*d.* per lb. The consequence is that the Dutch (nutmegs are a government monopoly in the Dutch settlements) pick out all the long nutmegs for the English market, and thus contrive to get them introduced at the low duty of 5*d.* per lb., while our own nutmegs of Singapore and Penang are obliged to pay 2*s.* 6*d.* per lb. It is ascertained that upwards of 200,000 of long nutmegs have been shipped at Batavia, and are at this moment actually on their way to this country. This quantity exceeds the total consumption of 1851; it will be admitted at the duty of 5*d.* per lb., and will exclude from the English market the nutmegs of Penang and Singapore, on which 2*s.* 6*d.* must be paid. The price of nutmegs (long and round) is about 1*s.* 10*d.* per lb.; the Dutch grower pays a duty of 22 or 23 per cent. on his when imported into this country, the English grower a duty of 136 per cent. The evasion of duty, which the regulations of the Board of Customs enables the Dutch to effect, may this year diminish the revenue from nutmegs, from £21,913 to £4,250.

"It is unnecessary for our present purpose to go through the whole catalogue of spices. Enough has been said to show the mischievous and anomalous character and tendency of the present duties on spices. Pepper, the poor man's spice, is exorbitantly taxed, while the spices of the rich are comparatively exempted. Heavy duties on nutmegs imported from any but Dutch possessions impede the extension of their cultivation in countries where our trade would be benefited by increasing the number of commodities for the British market. The complexity of the Custom-house accounts, the number of Custom-house officers, is increased by the levying of small amounts of a duty on a great number of articles, each yielding a small amount of revenue.

These considerations have again and again been pressed on the Boards of Trade and Customs, but fruitlessly. These facts show not only that our Customs' tariff requires further revision, but that the legislative power entrusted to the Board of Customs requires to be abridged, and that the Board of Trade requires a fillip to awaken it to a more active and conscientious discharge of its duties."

This article called forth the following letter from Mr. J. Crawford:—

"By the existing tariff nutmegs are charged with two different rates of duty; what are called 'wild' with 5*d.* a pound, and all others, which of course means all cultivated nutmegs, whether of British or foreign growth, with one of 2*s.* 6*d.* a pound, or six times that amount. I have no doubt whatever but that this assessment of duty originated in the mistake of fancying that there existed two essentially distinct kinds of nutmegs, of different qualities and values. A nutmeg of a long form is charged with the lower duty on the supposition that it is a wild one, but a round one, with the higher, because it is thought to be peculiarly a cultivated one; both having in reality this property. There is only one species of aromatic nutmeg, called by botanists *Myristica moschata*. This, in the native country of the aromatic nutmeg, exists both in the wild and cultivated state, and differs only in being better grown and yielding more fruit in the last of these states. The great authority for the nutmeg, although he wrote concerning it above 160 years ago, is the celebrated Rumphius, who lived and died in the Spice Islands. Rumphius describes the true nutmeg as being a native of the Molucca and Banda Islands, but chiefly of the last of these, which consists of six petty islets. He alleges that Nature has confined it to this small and remote corner of the globe in order to stimulate the industry of man, on the same principle that it has hidden gems and gold in the bowels of the earth. In its native country the nutmeg grows luxuriantly and easily, with little labour. During our occupation of the Spice Islands, on two occasions, about the beginning of the present century, we transferred the nutmeg to the British possessions, then Bencoolen and Penang; and, about thirty years ago, its culture was introduced to Singapore. In the two British settlements the nutmeg is at present extensively grown, both by European and Chinese proprietors, but beyond these and Bencoolen the tree has never yielded fruit, either in Asia or America. Even in the western parts of the Malay Archipelago itself, although the fruit be equally good as in its native place, the culture is attended with so much risk and expense, that if the Dutch spice trade were thrown open the probability is that it could not be carried on at all.

This, however, is a matter for the consideration of the planters, and I am satisfied the Government will be ready to remove all factitious obstacles that stand in the way of their legitimate industry. The account which Rumphius gives of 'the long,' miscalled in our tariff 'the wild,' and 'the round,' equally miscalled 'cultivated,' is so entirely to the point that I shall translate it. It is as follows:—'The nut itself is well known; the lower side is flat, and all over it is a little wrinkled. It is of two forms—the one oblong, the other round, both equally good, but the round usually the hardest. The true nutmeg is one only, but, as just said, of two forms. One tree, for example, will bear oblong, and another round nuts, a distinction which appears even in the leaves of the tree, one tree having them longer, and another shorter and rounder. Both nuts, however, are equally aromatic, and have the same virtues.' What the natives of the Maylayan countries call wild nutmegs are nutmegs (*Myristica*) only as to *genus*. Rumphius enumerates six species of this kind, of which he has described two. One only of the six had a slight aromatic flavour in the nut, but none at all in the mace, or arillus; the rest were utterly flavourless. Dr. Wallich informs me that he found five species in Singapore alone, every one wholly vapid and worthless as a condiment. In so far, therefore, as commerce is concerned, there is no such thing as 'a wild nutmeg,' except in the English tariff. It will appear from the price-currents that no distinction into wild or cultivated is made in the trade; but it would seem that at the Custom-house nutmegs of a long form are imagined to be wild, and admitted at the low, while the round, fancied to be the only cultivated ones, pay the high duty. Neither is there, as we might conclude from the equal quality attributed to them by Rumphius, any difference in their value and appreciation in the English market, the long very often fetching the highest price in bond, caused, no doubt, by their being more applicable, with the low duty, for home consumption. The result of the difference of duty turns out to be highly detrimental to the produce of the British possessions. This consists entirely of round nutmegs, whereas that of the Dutch is composed of both sorts, the long being selected for the English market for the benefit of the lower duty, and finding their way to it through Batavia and Singapore, as well as the European ports of Holland. The difference between the two rates of duty of 5*d.* and 2*s.* 6*d.* is, of course, 2*s.* 1*d.*, so that on two commodities of exactly the same value there may be an excess of 500 per cent. on one of them, and this one happens to be the product of a British possession competing with that of a foreign

one. In the price-current of the 'Economist' of the 14th of January, 1852, there are, without any distinction of wild or otherwise, four quotations varying from 9*d.* up to 3*s.* 9*d.* In another printed London price-current in my possession there are also four quotations for January, 1851, and the same number for January, 1852, the lowest for 1851 being 2*s.* 3*d.* and the highest 3*s.* 6*d.*; while for 1852 the prices were respectively 1*s.* 6*d.* and 3*s.* 3*d.* These meagre quotations do not give an adequate notion of the real state of the nutmeg market, and therefore I refer to an actual account of sales of fourteen cases of Penang nutmegs, sold on the 12th of December last, by Messrs. Crawford, Colvins, & Co., of the City, and which is now before me. The nutmegs amounted to 2,405 lbs. weight, and the gross price which they fetched was £217 19*s.* 9*d.*, which gives an average of 1*s.* 9 $\frac{3}{4}$ *d.* per lb., which may be called 1*s.* 10*d.*, as four out of the fourteen cases were sold exactly at this price. In the fourteen cases there were ten quotations, ranging from 7*d.*, the lowest (a damaged lot), up to 2*s.* 4*d.*, the highest. On the average price of 1*s.* 10*d.*, the duty on these nutmegs, which were the produce of Penang, and consequently all 'round,' was 2*s.* 6*d.* a pound, equal to an *ad valorem* duty, in round numbers, of 136 per cent. Had the nutmegs been long, they would have been of the same value in bond, and the Custom-house, calling them 'wild,' would have assessed them at 5*d.* a pound, so that the *ad valorem* duty on them would have been between 22 and 23 per cent. only. The flagrant injustice of continuing the present rate of duty, is, I think, certain. The quantity of nutmegs taken out of bond in 1851 was 194,132 lbs., and the revenue £21,913. At 2*s.* 6*d.* a pound it ought to have amounted to £24,266., so that the revenue lost (the consumption being supposed to be the same) the sum of £2,453. If practicable, it would be expedient to ascertain at the Custom-house the quantities of nutmegs that paid respectively the 5*d.* and 2*s.* 6*d.* duty, as also the rate of consumption of each kind for a period, say of ten years. As an *ad valorem* duty is obviously impracticable, I would suggest that the same rate of duty should be imposed on all nutmegs, since it is beyond doubt that their quality is essentially the same, and that all alike are the product of cultivation, their market values differing only in degree, according to season, and skill in growing and curing, as it is with any other article of culture. In cloves, for example, the same duty of 6*d.* a pound is imposed, although the prices, quoting from those of the present month of February, as given in the 'Economist,' range from 6*d.* a pound up to 1*s.* 2*d.* Mace is a still more remarkable example. The duty is the same as that on the round

nutmeg, although the prices range from 1s. 6*d.* to 2s. 9*d.* Neither is there any distinction drawn between the duty on mace of the long or so-called wild nutmeg, and that of the round, although if there were any sense in the distinction of duty between the two sorts of nutmegs, it ought equally to have been applicable to their maces; for the mace differs but little from the fruit it belongs to. I will only give one other example, that of coffee. The same duty of 28s. a cwt. is charged on every price ranging from 36s. to 88s. There is clearly no reason for making nutmegs an exception. I am of opinion that it would be expedient to lower the duty on nutmegs as well as to assimilate it on all nutmegs. The duty on the corresponding article of cloves is 6*d.*, and as nutmegs are about twice the value of cloves, a duty of 1s. a pound on them would, I think, be a just and fair one. This on the consumption of 1851 would yield a revenue of £9,706, or a defalcation of £11,207, which, however, would be greatly diminished by the increase of consumption resulting from so large a reduction as 1s. 6*d.* a pound. Such an increase would only be consonant with what has taken place in every other article of general consumption on a large reduction of duty, such as tea, coffee, and cocoa. Nutmegs themselves are a striking case in point. Up to 1819 the duty had been 5s. 5*d.* a pound, and the consumption about 56,000 only. In that year it was reduced to 2s. 6*d.*, and to this must be ascribed the enormous increase of 246 per cent. which has taken place in 30 years' time."

These two articles were not without effect, for a few days later the 'Daily News' said:—"We have the satisfaction of announcing that the Lords of the Treasury have made a beginning in removing the anomalies of the Customs' tariff of duties on spices. To a memorial presented by the nutmeg planters, they have replied that henceforth the same uniform duty (2s. 6*d.* per lb.) is to be levied on all nutmegs, and that the 5*d.* duty shall cease. The other anomalies in the spice-duty tariff which we pointed out require the aid of the legislature for their abolition. We trust it may not be long withheld."

Erratum.—P. 547, line 14 from bottom, for "S. Tabernæmontani was associated along with S. maritimus by the side of the same pond there," read, "Along with S. maritimus, by the side of the same pond, there was associated S. Tabernæmontani; this latter," &c.

NOTICES OF NEW BOOKS, &c.

'The Vegetation of Europe, its Conditions and Causes. By ARTHUR HENFREY, F.L.S., &c., &c. London: John Van Voorst. 1851.'

MR. HENFREY has undertaken an arduous task—that of collecting, arranging, and condensing into a convenient and accessible form, the accumulated materials of half a century in relation to the distribution of the European Flora. For although the systematic investigation of the laws which regulate the distribution of plants, is a branch of science of comparatively recent date, yet its progress of late years has been rapid indeed. It seems to have been only about the commencement of the present century, that philosophic naturalists began to reason upon observed and recorded facts bearing upon the distribution of vegetable forms over the face of the earth. These facts must indeed have early forced themselves upon the attention of travellers; for, as Humboldt has well observed, “observers who, in short periods of time have passed over vast tracts of land, and ascended lofty mountains, in which climates are ranged, as it were, in strata, one above another, must have been early impressed by the regularity with which vegetable forms are distributed.” Thus Tournefort on Mount Ararat, and Bembo on Etna, three centuries ago, compared the various zones or regions of vegetation as observed by them on the declivities of those mountains, with the similar zones or regions into which the earth may be divided in proceeding from the equatorial to the polar regions: and it was upon such observations that Humboldt founded his celebrated ‘Essay on the Geographical Distribution of Plants,’ which appeared in 1807, and served as the starting-point for a more elaborate and more extended work on the ‘Geography of Plants,’ which the same learned author gave to the world some ten years subsequently. In this last-named work the distribution of plants, whether on a large or a small scale, is shown to depend upon the physical qualities and conditions of the globe and its attendant atmosphere. Other philosophers have turned their attention to the elucidation of the laws of vegetable distribution; the consequence is, that none but those who are fortunate enough to be able to devote a considerable portion of their time to scientific research, are able to keep pace with the rapidity with which information on this interesting subject is accumulating: to many a lover of science, therefore, as well

as to the general reader, Mr. Henfrey's *résumé* must prove a welcome boon.

In the Introductory Chapter the universality of vegetation, and its varied influences upon the mind, are thus pleasantly pictured :—

“The pages of the book of Nature offer a vast variety of characters for our perusal, but of all we find there inscribed, none surpass in beauty of form or the interest of their revelations those presented by vegetable life. Mountain and valley, flood and lake, plain and undulating hill, may give the bolder features of a landscape, but dark and cheerless must the grandest combination of forms appear where the eye can find no green resting-place ; gloomy and repulsive the scene where no trace of vegetation, telling with its varying hue the tale of life and change, breaks the dull monotony of the stark masses of the earth's crust. It is difficult, indeed, to those who are without the actual experience, to picture in the mind those desert tracts which do actually exist upon the globe, where the burning sun sears out as it were the ordinary covering of the soil ; or those barren rocky shores, clothed but by a few lichens, where the inhospitable climate refuses a resting-place even to a blade of grass. We are connected with the vegetable world by so many ties, of pleasure, interest, and necessity, that we commonly regard its existence as a matter of course, and seldom pause to consider how and why it is, but merely direct our attention to those of its peculiarities which relate to its useful qualities, or which lend to it the manifold charms which delight our gaze in natural scenery. From the very infancy of our race the influence of vegetation upon the moral feelings has been recognized, poets have dwelt upon it in all ages, and scarcely a striking form or commonly recurring kind of plant is without its real or fanciful associations. Waving corn-fields ! even the bare mention of them seems to raise a vision of peace, plenty and contentment ; traversing the woodland path we cast awhile the cares that press upon us in the busy haunts of congregated man, and share the freedom and independence of the unrestrained life around ; or in the deep and silent solitude of the black pine forest, we feel revive within us that superstitious awe that gave birth to the strange traditions of our northern ancestors. No temperament at all awake to the influence of external nature can escape the depressing influence of the low swampy plain, where among plashing water-courses the ‘cluster'd marish-mosses’ creep, and amid the rustling reeds

‘Willows whiten, aspens quiver,
Little breezes dusk and shiver.’

"Few behold unmoved the brilliant tints of the spring buds, fringing the spray of every re-awakening tree like a joyous decoration celebrating the return of warmth and active life, or the graduated hues of autumn's garb ;—they typify to us too plainly the changeful course of our own existence not to arouse something more than a passing feeling of wonder or admiration."—P. 1.

Mr. Henfrey then briefly alludes to the comparatively modern origin of botanical geography as a science ; and proceeds to show its early stages and gradual development in the following words :—

"The contrasts and diversities among the characteristic vegetations of different lands force themselves upon the most superficial observer. Since the earliest period of which we have record, the peculiarity of certain plants to certain countries or regions has attracted observation, and the narratives of the earlier navigators of European nations are full of glowing pictures of the treasures unfolded to them in the more favoured climes to which they penetrated. The tropics were depicted as earthly paradises, in which

‘ Droops the heavy-blossom’d bower, hangs the heavy-fruited tree,
Summer isles of Eden lying in dark-purple spheres of sea ;’

and in which man lies idly waiting while nature pours out at his feet the rich harvest of luxurious fruits, unknown in our temperate regions, where the ever-recurring check periodically arrests the forces of vegetation, and the less favouring climate compels him to the labours of the field, yielding to his toil and uremitting care a limited and frugal recompense. Travellers had told, too, that in the far north even this partial bounty is denied ; that man is cut off altogether from that vegetable food which is lavished in profusion at his slightest demands beneath a warmer sky, while his companion the reindeer scrapes a scanty repast from beneath the snowy covering of the soil.

“‘The carpet of flowers and of verdure spread over the naked crust of our planet is unequally woven ; it is thicker where the sun rises high in the ever-cloudless heavens, and thinner toward the poles, in the less happy climes where returning frosts often destroy the opening buds of spring or the ripening fruits of autumn.’

“But even in a smaller compass, on a smaller field, striking differences occur, and facts familiar to every educated person mark the existence of some regulating influence even within the limits of the smallest of the continents of the world. We cultivate the grape in England, but it is only in favoured spots, and then even not with certainty, that it will ripen properly in the open air ; yet but a little

further south it is so much at home, that it yields one of the necessities of life to the entire population. Oranges will ripen on the other side of the Alps, but not on this. For those cereal grains, those corn-plants furnishing the principal portion of the food of man, we find distinct lines of demarcation extending across Europe, beyond which, northward, each kind ceases to be capable of ripening its seed. Of trees we know that certain kinds will flourish and form fruits at points far north, where others are arrested by the cold; the firs, for instance, exclusively constitute the most northern woods of Scandinavia, while the dwarf palm, a representative of tropical climates, maintains its footing even so far into the temperate region as Italy and the southern confines of France.

“Again, as indeed must be perceptible to every one who has visited mountainous countries, vegetation alters in its characters at different elevations, and it has been shown that these variations correspond to those which are observed on the level plains in proceeding from the south towards the north; the increased severity of the climate of the higher localities acting exactly in the same way as the colder climate of the regions lying further from the equator.

“Such facts as these, obvious as they appear to be, remained unconnected and unaccounted for until recent times, or differences of heat and cold were supposed to be sufficient to explain them. But when a more searching inquiry arose, and when the vague ideas respecting the influence of heat came to be systematically investigated, it was found that there were other facts and that other causes were at work, the existence of which had not previously been suspected. In the first place it was seen, that mere degree of latitude will not indicate the temperature of a climate; that the temperature, the average heat and cold, do not alone constitute the climate properly so called, but that humidity, exposure to prevailing winds and many other influences conjoin to produce the atmospheric conditions powerfully affecting vegetation. The chemical and physical conditions of the soil were found to require investigation, in order to the explanation of facts otherwise anomalous; and finally it has been discovered that the particular constitutions of the individual species of plants must be studied, if we would rightly understand the causes which give the peculiar characters to the vegetation of different lands.

“And after all these points have been considered, there is still a residuum of phenomena which they totally fail to account for; we are in possession of another series of facts which require to be

explained by a wholly different set of causes, as will appear from the following observations.

“When we compare the floras, that is, the lists of native plants, of two countries closely alike in physical conditions, we generally find a difference resulting from the absence of certain kinds in one which exist in the other, and *vice versâ*; moreover, these may be kinds, which when introduced into the country where they were wanting will flourish there with a luxuriance equalling that in their native habitation. This shows it is not the physical or external conditions which have prevented their growth, and we therefore ask why were not they present at first in both?”—P. 4.

The author in continuation briefly alludes to the opinion now entertained by many, that the earth has gradually become clothed with vegetation “partly by the spreading of some special kinds from centres within those countries where they were originally exclusively created, and while these have spread outward into the neighbouring regions, colonists from like centres lying in the surrounding countries have invaded and become intermingled with the indigenous inhabitants.” Thus, by the side of the climatic and other physical influences exist “a second and totally different set of conditions, which must be thoroughly investigated before we can clearly understand the manner in which the vegetable inhabitants of the world have acquired their present positions and relations toward each other.”

Another influence controlling the distribution of plants, and that a most powerful one, is the agency of man. Mr. Henfrey truly states that “Important as the effects of climate are, and not to be combated beyond a certain point, yet is the struggle with the elements vigorously sustained, above all in the north of Europe; curious and striking as are the phenomena of the spontaneous migrations of plants, they sink into insignificance beside the operations of man’s improving hand. Barren plains are forced to yield a crop of food-plants; bogs and marshes are drained and turned into arable land; vast tracts wrested from the sea and brought under the dominion of the husbandman. The bare escarpments of the rocky banks of the rivers of Germany are terraced by the patient hand of industry, and converted into smiling vineyards. The whole face of the more populous countries is changed, and a view of the vegetation of Europe would be deficient in some of its most attractive and important features, without a sketch of the distribution and characters of the cultivated plants.”—P. 9.

A slight allusion follows to the “history of the changes which have

gone on in earlier epochs of the earth's existence, before man trod upon its surface, and claimed dominion over the surrounding creation." Mr. Henfrey then enters more fully upon his task, and the second and third chapters of the volume are devoted to a consideration of the operation of general and special influences on the distribution of plants. To the class of *general* influences are referred all those conditions which, as he well says, "*allow* of particular conditions of vegetation in different regions;" to the class of *special* influences belong those "circumstances which *cause* the peculiar vegetation of particular places." Under the former class are comprised the influences of temperature, elevation, the winds, ocean currents, light, moisture, soil, and climate; to the latter are referred areas of distribution, the diffusion and limitation of species by physiological, physical, and animal agencies, and the geological modification of areas of distribution. This is followed by a general consideration of the characteristics of the countries of Europe, and a separate examination of the natural provinces into which Europe may be divided, according to the views of Professor Schouw, as developed in his 'Sketch of the Physical Geography of Europe.'

In the chapter on the British Islands, the author has largely availed himself of the labours of Mr. H. C. Watson, the merits of whose great work on the distribution of British plants—the 'Cybele Britannica'—are not yet so fully known and appreciated among botanists as they deserve to be, or as they certainly will be hereafter. The published works of other botanists have supplied materials for the chapters on the floral conditions of the Continental countries; and if the style of the work be occasionally rather loose and unconnected, it perhaps is so rather in consequence of the materials being derived from so many sources, than of any fault in the author, who has, it seems to us, well succeeded in his task, notwithstanding the difficulties which he had to encounter. "Many men many minds" is an old adage; and to bring the labours of these minds into union is beyond the power of man. Of these difficulties, and of the somewhat fragmentary character thereby impressed upon the work, Mr. Henfrey himself seems to be fully aware, since he tells us that "the present volume is to be regarded merely as a sketch or rough draft, in which the principal results of past investigation are for the first time brought together into one view." We could have wished that the authorities whence the information has been derived had been more frequently indicated: *Suum cuique tribuito* is a wholesome axiom which in book-making should never be lost sight of.

From the concluding chapter we must give one quotation, which well illustrates the prevalence of what has been termed the "law of compensation," throughout the habitable globe. After adverting to the distinctive features of North and South Europe, as displayed in the level character of the former contrasted with the mountain chains and intervening valleys of the latter, the author proceeds :—

"Through this mountainous character, the Italian, the Greek and the Spaniard possess great advantages over the North-European ; for in accordance with the well-known law of the influence of altitude upon climate, they can ascend from their own southern valleys, full of luxuriant vegetation, to the mountain sides clothed by the rye-fields, the meadows, and the hazel bushes of the north, and seek around the alpine summits the hardy little members of the Lapland flora, or at any rate find there, amid the snow and ice which exist around their peaks through winter and summer, a vegetation which will furnish them with an adequate idea of the scanty alms bestowed by the earth in arctic regions.

"But the untravelled northern must be satisfied with hearing of the evergreen woods, the olive groves, the orange gardens, and the like, which flourish in the clear air, and bear unscathed the comparatively mild temperature of winters of the South. Yet a contemplation of the conditions of Northern Europe reveals, that though less richly endowed, it is not less cared for than the South, and a multitude of influences are found at work, modifying the law of diminution of temperature with increasing latitude, and producing a variety in the phenomena more than compensating for the deficiency in those features which have given a romantic celebrity to the lands of the ancient civilization of Europe.

"The greater difference of the seasons, and the comparatively high summer temperature of the North, exercise a very advantageous influence on the vegetation there ; for although the cold of winter arrests the activity of vegetable life, it does not destroy it, and the high summer heat, in the season of the growth generally, and in the time of ripening of fruits and seeds in particular, is exceedingly favourable. If the seasons were equable, the North would have an eternal spring, snow and ice would never be seen, for instance in England ; but neither would corn ripen ; probably even there would be no woods, except perhaps in the south-west corner ; for at Quito, in the table-land of Peru, where the seasons are very equable, the culture of wheat ceases at the mean temperature of Milan, and the woods disappear at the mean of Penzance, lower than that of London. This favouring

influence of unlike seasons is seen also in comparing the coasts and inland regions. Iceland and the Feroës have neither corn nor forests, while both occur on the mainland in places which have a much lower mean temperature; the limits of the vine and maize rise higher towards the north in Germany than on the west coast of France. Maize ripens in the valleys of Tyrol, where snow lies upon the ground during five months of the year, while it seldom becomes perfectly matured even in the South of England.

“Those plants which require a mild winter will not grow in the North of Europe, but they advance along the western coast under the influence of the maritime climate, and the myrtle of the South is seen in the S.W. of England.

“From the greater difference of the seasons, the approach of spring is more striking in the North than in the South. A gentle warmth succeeds to the severe cold of winter, the lakes and rivers thaw, the snowy covering of the soil vanishes and gives place to grass and herbs, the trees and shrubs burst into leaf, the migratory birds return, and the insect world comes forth from its winter hiding-places. In the South, where no snow lies upon the ground, where the fields and meadows are green through the winter, and most of the trees and shrubs retain their leaves, the changes are less important; merely more plants grow up and flower, more trees become clothed with leaves, and animal life shows itself more abundantly.”—P. 366.

‘The Botany of the Voyage of H.M.S. Herald, under the Command of Captain Henry Kellett, R.N., C.B., during the years 1845—51. By BERTHOLD SEEMANN, Memb. Imp. Acad. Nat. Cur.; Naturalist to the Expedition. London: Reeve & Co. 1852.’

The surveying ship ‘Herald,’ under the command of Captain Kellett, sailed from Plymouth, in company with the ‘Pandora,’ on the 26th of June, 1845, touched at Santa Cruz, in the Island of Teneriffe, on the 13th of June, and entered the Bay of Rio Janeiro on the 19th of August. Thence both ships sailed for the Falkland Islands; and then, steering directly south, they encountered a large iceberg in the night, and parted company. Rounding Cape Horn, the ‘Herald’ made Valparaiso on the 14th of November, and found that the ‘Pandora’ had arrived fourteen days earlier. At this place, as well as at Pichidanque, the highest peak of the Andes, called Aconcagua, was

measured, and found to be 23,000 feet in height. Steering north, the ships made the river Sua, in Ecuador, on the 22nd of January, 1846; and it was here that poor Edmondston lost his life, by the accidental discharge of a rifle. After surveying the Bay of Choco they sailed northward to Panama, leaving that place on the 16th of April, and returning there, after visiting San Francisco, Acapulco, and Guatemala, on the 17th of January, 1847. Here they were joined by Mr. Seemann, appointed Naturalist to the Expedition in the place of Mr. Edmondston. Until the 24th of April, 1848, the ships were employed in surveying the coasts of South America; and then the destination of the 'Herald' was entirely changed. The non-return of Sir John Franklin began to excite much apprehension; and Captain Kellett received orders to co-operate with the vessels composing the Relief Expedition. The 'Herald' immediately sailed north, and on the 14th of September anchored off Chamisso Island, Kotzebue Sound. An account of Mr. Seemann's botanical labours in this district form the first subject of the work now commenced; and we shall allow him to speak for himself in describing these little-known regions.

"The whole country from Norton Sound to Point Barrow is a vast moorland, whose level is only interrupted by a few promontories and isolated mountains. The rain and snow-water, prevented by a frozen soil from descending, forms numerous lagoons, or, where the formation of the ground opposes this, bogs, the general aspect and vegetation of which do not materially differ from those of Northern Europe, being covered with a dense mass of lichens, mosses, and other uliginous forms. Places less covered with plants are sometimes difficult to pass. The ground is soft, and covered with isolated tufts of *Eriophorum capitatum*. In walking over them some of the tufts give way, or the foot slides and sinks into the mud, from which it is often difficult to extricate it. Wherever drainage exists, either on the shores of the sea, the banks of rivers, or the slopes of hills, the ground is free from peat. Such localities are generally clad with a luxuriant herbage, and produce the rarest, as well as the most beautiful plants.

"The aspect of some spots is very gay. Many flowers are large, their colours bright, and though white and yellow predominate, plants displaying other tints are not uncommon. Cape Lisburne, one of the most productive localities, looks like a garden. The *Geum glaciale*, with its fine yellow blossoms, is intermingled with the purple *Claytonia sarmentosa*, and a host of *Anemones* and white and yellow *Saxifrages*, or the blue *Myosotis alpina*. But such spots are rare, they are like oases in deserts. The Flora cannot be said to possess an

imposing aspect. There is nothing to relieve the monotony of the steppes. A few few stunted Coniferous and willow trees afford little variety, and even these, on passing the boundary of the Frigid zone, are either transformed into dwarf bushes, or disappear altogether. About Norton Sound groves of white spruce-trees and *Salix speciosa* are frequent; northwards they become less abundant, till in latitude $66^{\circ} 44' 0''$ north, on the banks of the Noatok, *Pinus alba* disappears. *Alnus viridis* extends as far as Kotzebue Sound, where, in company with *Salix villosa*, *S. Richardsoni*, and *S. speciosa*, it forms low brushwood. With the commencement of the Arctic circle, *Alnus viridis* ceases to exist; *Salix speciosa*, *S. Richardsoni*, and *S. villosa* extend their range farther, but are only for a short distance able to keep their ground; at Cape Lisburne, in latitude $68^{\circ} 52' 6''$ north, they are in the most favourable localities never higher than two foot, while their crooked growth and numerous abortive leaf-buds indicate their struggle for existence. All attempts to spread their dominion towards the north prove unsuccessful; two degrees higher, and they are seen no more. At Wainwright Inlet a boundless plain presents itself. No tree interrupts the uniform line of the horizon, no shrub shows itself above the level of the turfy vegetation; all woody plants are prostrated to the ground, and only maintain life by seeking shelter among the mosses and lichens. The polar wind, which never affects the graceful palm, and is incapable of injuring the hardy oak, yet at last succeeds in laying low the offspring of Flora in these regions. Here they are doomed to slumber two-thirds of the year without sun, without warmth, in an icy bed, till the return of the great light restores the brightness of day and enables them to resume, for a few weeks, the busy operations of organized beings."

"It is not often that a Flora is so strictly original, and that its general character may be so accurately defined. Out of 242 Phanerogams, 2 are trees, 23 shrubs, 194 perennials, 7 biennials, and 12 annuals. Nature does not seem to have trusted to the region many plants whose propagation solely depends upon the ripening of their seeds; an uncertain harvest in a district where the quick approach of winter puts a sudden stop to vegetable operations. Nor are the physical circumstances favourable to the formation of wood. Most of the ligneous plants are mere fruticuli, very dwarfish, and more under the ground than above it. Only a few willows, a rose, the red currant, a birch, and a *Spiræa* are deserving of the name of shrub. Trees are still more scarce, no more than two kinds (*Pinus alba* and *Salix speciosa*) having as yet been discovered. The white spruce

occasionally attains the height of forty or fifty feet, and a circumference of from four to five feet. The largest willow (*S. speciosa*) seen was twenty feet high and nearly five inches in diameter. It had such a juvenile appearance that, judging from the growth of trees in milder climates, it would have been pronounced to be five or six years old; yet on closer examination its age proved more than eighty years. The leaves are alternate in 208 species, opposite or verticillate in 30, simple in 224, and compound in 15. Many flowers are large, 170 regular, and 69 irregular. The predominant colour of the floral envelopes is white in 83 species, greenish in 59, yellow in 43, purple in 24, blue in 17, rose-colour in 7, and red in 3. It is remarkable that red only occurs in three instances, and that scarlet is wanting. The predominance of white in plants approaching the Pole is analogous to the change of colour of many Arctic animals,—the ermine, the ptarmigan, the hare, and others, whose outer covering turns white in the beginning of winter. The fruit is dry in 33 species, and succulent in 9. Thus, speaking generally, it may be said that the plants of Western Eskimaux-land are perennial herbs, have alternate, simple leaves, regular white or yellow flowers, and a dry fruit. In all, 315 species have been discovered: 35 Thallogens, 38 Acrogens, 45 Endogens, and 197 Exogens; or 242 Phanerogams and 73 Cryptogams. The most numerous orders are the mosses and Compositæ, the former being represented by 30, the latter by 26 species. Then follows the family of the lichens with 21 members, that of the grasses with 20, Saxifragæ with 19, Rosaceæ with 18, Cruciferae with 17, and Ranunculaceæ and Carophylleæ each with 15. The most extensive genera are Saxifraga, containing 18 species, Potentilla 9, Salix, Ranunculus and Polytrichum 8, and Pedicularis and Hypnum 7; Senecio has but 6 representatives, and the rest still fewer.

“The greater number of these plants are common to the Alps, the Rocky Mountains, and the northern portions of Europe and Asia; some even are inhabitants of the Antarctic countries. Few are peculiar to Arctic America, and only three, *Artemisia androsacea*, *Seem.*, *Eritrichium aretoides*, *Alph. DeCand.*, and *Polytrichum cavifolium*, *Wils.*, have exclusively been found in Western Esquimaux-land. Formerly a considerable number were thought to belong to the Polar regions of the north. In proportion, however, as knowledge increased, the endemic species have either been reduced to mere forms or varieties, or have proved to be plants common also to other countries. Now only a few remain, and there is reason to suppose that even these few will be found to extend their range over a much wider extent of

surface than is at present assigned to them. The corroboration of this supposition would be productive of important results. It would throw additional light upon the geographical distribution of vegetable forms, and prove that the diffusion of plants had taken place, not from north to south, but from south to north,—a direction which, in the absence of these data, may be supported by plausible arguments.

“An essential difference exists between the Flora of the southern and the northern portions of Western Eskimaux-land, a few degrees in so high a latitude exercising a marked influence. In the southern or subarctic region there are still plants which the eye is accustomed to meet in the plains of more temperate climates, such as *Rosa blanda*, *Spiræa betulæfolia*, *Achillea Millefolium*, *Ribes rubrum*, *Corydalis pauciflora*, *Lupinus perennis*, *Sanguisorba Canadensis*, and *Galium boreale*; besides annuals and biennials, and shrubs and trees. However, in proceeding northward and having entered the Arctic circle, these forms disappear; the trees dwindle into low crooked bushes, and annuals and biennials cease almost entirely, the remaining plants being such as depend for their propagation rather on their buds than seeds. They are chiefly perennial herbs with cæspitose habit, such as *Geum glaciale*, *Artemisia borealis*, *A. glomerata*, *A. androsacea*, *Stellaria dicranoides*, *Dryas octopetala*, *D. integrifolia*, *Saxifraga cæspitosa*, and *Androsace Chamæjasme*. These, and mosses, lichens, cotton-grasses, and low willows, chiefly cover those endless steppes whose uniform aspect renders the Arctic region so dreary and monotonous.

“A peculiar feature of the vegetation is its harmless character. The poisonous plants are few in number, and their qualities are by no means very virulent. The traveller need not fear to get blinded or giddy by entering a thicket; no members of those families to which the Mazanillo, the Upas-tree, or the nightshade belong, inhabit the extreme north. He need not be afraid to be hit by an arrow dipped in the sap of the deadly Wourali,—no *Loganiacea* extends its range to these latitudes,—nor be much on his guard against spines and thorns. Save the *Geum glaciale*, and a rose—which forms no exception to the rule incorporated in a popular adage,—there are no plants bearing arms, belonging to that group which has been termed the ‘*milites*.’”

“When considering the Flora in a commercial point of view, we find, as far as our present knowledge enables us to see, no productions which would play a prominent part in the traffic of civilized nations. Of wood there is only a limited quantity, and that is too far

inland ; the leaves of the *Rumex domesticus* and the different scurvy-grasses, as well as the roots of some *Polygonums*, may, in the absence of better vegetables, serve for culinary purposes, and they may even, under cultivation, become more palatable ; the various kinds of berries may be highly useful to the Eskimaux, destitute as they of any other fruit, and they may be most welcome antiscorbutics to those voyagers whose daring leads them to the Polar Seas ; the Iceland moss and other lichens may be useful tonics and dyes ; but all these productions are of little or no commercial importance. Should the country be ever inhabited by a civilized people, they will have to look to the animal creation for those means which procure the commodities of more favoured climes, and they will have to exchange walrus-tusks, eider-down, furs, and train oil, for the spices of India, the manufactures of Europe, and the medicinal drugs of tropical America."

Writing of the phenomenon of the never-setting summer sun in high northern latitudes, Mr. Seemann makes the following highly interesting remark, which shows how universal are the laws by which the vegetable world is governed :—

"It must not be supposed that during this time the sleep of plants is suspended. That function, though short, is as regular as in the tropics. With a midnight sun several degrees above the horizon, the leaves droop when evening approaches, partaking of that rest which seems to be necessary to the existence of both animal and vegetable life. If man should ever reach the Pole, and be undecided which way to turn,—when his compass has become sluggish, his timepiece out of order,—the plants which he may happen to meet will show him the way ; their sleeping leaves tell him that midnight is at hand, and that at that time the sun is standing in the north. Human skill has long tried to construct instruments to aid those venturing to the Pole to find their way back. How curious, if an all-wise Providence should have extended the range of a few Leguminous plants to the very axis of our planet, and made some humble herbs the means of furthering the solution of the greatest of geographical problems !"

It will be next to impossible for the botanist to read these copious extracts without perceiving how admirably the author is fitted for the task he has undertaken. In thus dividing the botanical acquisitions made during the voyage of the 'Herald' into separate Floras, he has adopted the only course by which the result of his labours could be reduced to an intelligible and useful form. To English botanists this Florula of West Eskimaux-land is particularly acceptable and interesting, since, notwithstanding the vast range both of latitude and

longitude by which we are separated from the inclement shores of Kotzebue Sound, we cannot fail to be struck with the similarity of its vegetation to that of the northern extremity of Great Britain, and especially of our outlying islets,—a similarity in general character rather than identity of species; thus showing the importance of geographical botany as a science, and the precision with which results may be predicated even with the diameter of the earth intervening between the philosopher and the object of his speculations. We shall be truly glad to receive the second instalment of this admirable work, and in the mean time sincerely congratulate the author on the manner in which this first part has been brought out.

Hooker's 'Journal of Botany and Kew Garden Miscellany,' Nos. 39 and 40, April and May, 1852.

This periodical, after having been discontinued for a month, is now re-issued; but, its former price “being,” in the words of Messrs. Reeve, “insufficient to meet the cost of printing and paper,” two shillings will in future be charged for each number. We cannot conceal our surprise that a journal with such means at its disposal should have arrived at a state when its very continuation has become a matter of uncertainty. This decline is owing to various reasons; and the measure now adopted is, in our opinion, not calculated to remove them: for although there are many naturalists in this country who must take in the publication, let the price be one or two shillings, yet a great number will content themselves with those extracts which other magazines will give. The publishers are to blame for not taking any pains in making the periodical known. We have never seen it advertised in any but Messrs. Reeve’s own sheets, and certainly never in any of the continental journals. The editor also is to blame for inserting those long papers on descriptive botany, containing nothing save diagnosis. They may look very well in the Linnæan ‘Transactions,’ but are sadly out of place in a monthly periodical which contains only thirty-two pages of letter-press. The space ought to be filled up with readable matter; dissertations on difficult genera and natural orders, reports on scientific journeys, reviews, &c.

No. 39 contains:—‘Eloge on Professor Ledebour; by C. F. P. Martius.’ ‘The Camphor-tree of Sumatra; by W. H. de Vriese;’

translated from the Dutch. 'Florula Hongkongensis; by George Bentham.' 'Abstract of the Voyage of H.M.S. Herald; by Berthold Seemann.' Notices of Griffith's 'Palms of British India,' Bertoloni's 'Miscellanea Botanica,' and Bertoloni's 'Illustrazioni di Piante Mozambigesi.'

The new plants described in the continuation of the Hong-Kong Florula are:—*Milletia speciosa*, *Champ.*, *M. Championi*, *Bth.*, *Bowringia callicarpa*, *Champ.* (gen. *Sophorearum*, affine *Baphiæ*), *Ormossia?* *pachycarpa*, *Champ.*, *Cæsalpinia vernalis*, *Champ.*, *Phanera Championi*, *Bth.*, *Albizzia?* *Championi*, *Bth.*, and *Eriobotrya fragrans*, *Champ.*

The journal of the voyage of H.M.S. 'Herald' describes Mr. Seemann's stay at Singapore, his voyage through the Straits of Sunda to the Cape of Good Hope, and accounts of the Gambir, the Isonandra Gutta, the arrow-root, and various other interesting productions of the Indian Archipelago.

No. 40 contains:—'Decades of Fungi; by M. J. Berkeley;' (in which seventeen new species of *Agaricus* are described). 'Contributions to the Botany of Western India; by N. A. Dalzell.' 'Notice of *Dammara macrophylla*, *Lindl.*, a new Conifera; by Sir W. J. Hooker.' 'Florula Hongkongensis; by George Bentham.' 'Note on the Spines of Cactuses; by Berthold Seemann.' 'Botanical Information:—Dr. A. Blanco; Bourgeu's Spanish Plants; Drummond's Plants of Western Australia; Superstitions with regard to the Glastonbury Thorn.' Notices of Harvey's 'Nereis Boreali-Americana' and Jaubert and Spach's 'Illustrationes Plantarum Orientalium.'

In the Contribution to Indian botany the following new species are described:—'*Casearia graveolens*, *Dalz.*, *C. lævigata*, *Dalz.*, *C. rubescens*, *Dalz.*, *Marrubium Malcolmianum*, *Dalz.*, *Diospyros paniculata*, *Dalz.*, *D. pruiens*, *Dalz.*, *D. nigricans*, *Dalz.*, *D. Goindu*, *Dalz.*, *Eria uniflora*, *Dalz.*, *Dendrobium crispum*, *Dalz.*, *Cassia Goensis*, *Dalz.*, *Typhonium bulbiferum*, *Dalz.*, *Lycopodium empetrifolium*, *Dalz.*, *L. miniatosporum*, *Dalz.*, *L. cæspitosum*, *Dalz.*, and *L. curvatum*, *Dalz.*

In the Flora of Hong Kong we find enumerated as new:—*Meme-cylon ligustrifolium*, *Champ.*, *Acmena Championi*, *Bth.*, *Begonia Bowringiana*, *Champ.*, *Hedera parviflora*, *Champ.*, and *H. protea*, *Champ.*

On the Distribution of the Erica Mediterranea, var. Hibernica, and some other Plants, in Ireland. By DAVID MOORE, Esq.*

HAVING lately made a journey to the West of Ireland, for the purpose of collecting some of the rare plants which grow and flower there at this early part of the year, I am afforded this opportunity to communicate a few observations in connexion with this subject which I have been enabled to make. It is admitted by botanists that one of the most interesting additions which have been made to the Irish Flora for many years was that of the Mediterranean heath (*Erica Mediterranea, var. Hibernica*), which was first discovered by Dr. Mackay, in the county Galway, growing near the base of Urrisbeg Mountain. Thence it has been observed by subsequent botanists along the coast to the Barony of Erris, county Mayo, where I recently obtained it in abundance. C. Vernon, Esq., of Clontarf Castle, first called my attention to this locality, in the spring of 1830, when he sent me specimens which he found growing on his shooting-grounds among the Ballycroy Mountains. These specimens were all of dwarf habit, with much darker coloured flowers than any I had previously seen,—characters which greatly enhanced their value in a floricultural point of view, and showed they belonged to a variety which it would be desirable to obtain for cultivation in the garden. They appear also botanically interesting when compared with those of our early-flowering garden-heath (*Erica carnea*), from which they were scarcely to be distinguished. I was therefore more anxious to see the plants growing naturally in Erris, and to bring some for cultivation along with specimens for distribution. Favoured by the late fine weather, I was enabled to examine a portion of that wild mountainous district, and after considerable labour was rewarded by seeing one of the grandest sights I ever beheld in the way of indigenous plants. To find a district of at least a quarter of a million of acres in extent covered with this lovely heath, in full bloom, during the second week in April, forms perhaps the most remarkable botanical feature the British Islands can afford. What appeared further remarkable was its taking full possession of the ground, to the almost total exclusion of the other kinds of common heaths. The flowers were generally of a deep pink colour, and the plants grew from six inches to a foot high. On seeing so much of it together, and knowing that

* Read before the Royal Dublin Society, April 30, 1852.

white varieties of most of our wild heaths are occasionally found, it occurred to me it might also be the case with this species; and after a laborious search I found a plant with white flowers, which I believe to be the first instance of the kind on record, rendering it both important and valuable. This variety appears to connect the two nearly-allied species still more closely, which most botanists consider to be distinct, though they are united in DeCandolle's *Prodromus*, where *E. Mediterranea* is described as the var. β . of *E. carnea*. At this early part of the year few of the other wild plants of the country had made much progress. I, however, observed one, which I had never before distinguished satisfactorily, namely, the wild morello cherry (*Prunus Cerasus* of Linnæus). This species has, until lately, been mixed up with *Prunus avium* by British botanists, which is a much larger tree, producing its flowers in greater clusters, though smaller individually than those of *P. Cerasus*. The plants were growing near the side of the river which passes Ballina, on the demesne of Colonel Gore, where they did not appear to be scarce. *Sesleria cærulea*, a species of grass, which is, I believe, confined to the western counties of Ireland, was in full flower near the same locality, and growing within tide-mark. In England and Scotland this is considered a subalpine grass, and only grows in mountainous districts at considerable elevation; it is, therefore, singular to find it prefer so low a level in Ireland. Expecting to find some rare mosses and lichens, I ascended Nephin Mountain, from the Crosmolina side. The common plants on it were the sea pink (*Armeria maritima*) and a well-defined variety of *Saxifraga umbrosa*, resembling *S. hirsuta* more than any other in the roundish outline of the leaves, with sharply-crenated edges. Their foot-stalks were, however, different from those in the true *S. hirsuta*, being nearly smooth and flattened on the upper surface. The number of species of *Saxifraga* and their abundance on the mountains in the west and south of Ireland, with the number of Ericaceous plants which occur there, constitute most remarkable features in our indigenous botany, such as are not to be observed elsewhere in Britain, indicating the meteoric and physical characters to be different to those which influence other parts of the country, as they are the circumstances which are known to affect vegetation in the highest degree. By observing the configuration of the west coast of Ireland on the map, and comparing it with the east coast, the reason why the two sides of the island have different climates, and consequently a different vegetation, seems obvious enough. The deeply-indented margin of the former shows a very irregular out-

line of small peninsulas, among which deep bays and arms of the sea flow, with a back-ground intersected in many places by a mountain range, which protects the sea-board from the north and east, and also tends to attract the abundance of moisture rising from the Atlantic, whilst that of the latter is more regular and unbroken, being exposed to those points. The more westerly longitude may have some effect on the flora of the western counties ; but the more equal temperature and greater degree of moisture which prevail there are, no doubt, the principal agents which produce so marked a change. The circumscribed locality of some of the species is more difficult to account for than vegetation *en masse*. Why a plant should confine itself to one or two limited spots in a country which possesses many more such places, both in general features and similar geological formation, and be unable to overstep a certain boundary, presents an interesting subject of philosophical inquiry to the generalising mind. For example, the rare and beautiful orchid, *Spiranthes cernua*, has only hitherto been discovered to grow in one small field near Berehaven, county Cork. The St. Dabeoc's heath (*Menziezia polifolia*), another Irish plant, is confined chiefly to the Connemara bogs, and does not, I believe, even occur in Kerry, where every collateral circumstance favourable for its growth seems to be present. The other known Continental localities are the Western Pyrenees and Anjou, in France, where it is said to be confined to the one spot. *Gentiana verna*, our beautiful spring gentian, which is now so pretty in its wild habitats, and also in our gardens, occupies only a narrow strip across the centres of the western counties, occurring at intervals from Corofin, in the county Clare, to near Holymount, in the county Mayo, and does not, I believe, extend further to the east, south, or north. Numerous other such instances, even better marked, could easily be pointed out. On a similar mode of reasoning more species of heath may yet be expected to be found in Ireland. *Erica multiflora* and *E. arborea*, which grow in parts of France and Spain, may be in some unfrequented spots among the wilds of Erris, as also may *E. stricta*, which is already stated to be an Irish species in DeCandolle's *Prodromus*. "Etiam in Hibernia boreali" are the author's words, which, I fear, is a mistake. The West of Ireland would be a much more likely locality for it to occur along with so many of its kindred.

DAVID MOORE.

Gymnogramma leptophylla in Scotland. By the REV. W. W. SPICER, M.A.

SEEING in the February 'Phytologist' the "supposed discovery of *Gymnogramma leptophylla* in Scotland," I wrote to the discoverer (Miss Veitch), in Madeira, to ascertain the exact locality of the plant in Aberdeenshire. That lady very kindly and promptly sent me the communication, of which the following is a copy:—"I have much pleasure in informing you that the specimen of *Gymnogramma leptophylla* in my possession I discovered in a stone dyke on the high road, on the right-hand side, leading from Braemar (Aberdeenshire) to Ballater, nearly opposite Invercauld House, and as far as I remember, where the Highlanders perform their annual feats at the gathering, *viz.*, a rock called the Lion's Face, at the foot of which, enclosing trees, is the above-named dyke." Believing the discovery of this little fern in Great Britain to be a matter of some interest to botanists, I have no hesitation in asking you to insert the above in the 'Phytologist.' The next thing will be, for those near the spot to endeavour to re-find the fern.

W. W. SPICER.

Itchen Abbas, April 28, 1852.

A Word for Narcissus incomparabilis, Curt.

By JOHN G. BAKER, Esq.

HAS not this beautiful *Narcissus* almost as good a claim to a place in the lists of naturalized British species as some of its allies? In this neighbourhood it appears thoroughly and permanently established in a walled pasture near the junction of the branch of Cod-beck that rises near Felis Kirk with the main stream, where, in company with *N. biflorus* and a small quantity of *N. Pseudo-narcissus*, it covers a considerable space of ground. The field is about mid-way between the villages of North and South Kelvington, and is contiguous to an old farm-house, from which the plant has most likely been introduced in Catholic times, when the house has been a place of more importance than at present, though a portion of it is still occasionally used as a chapel.

JOHN G. BAKER.

May, 1852.

The Taban-tree. By BERTHOLD SEEMANN, Esq.*

THE Taban (*Isonandra Gutta*, Hook.), which was formerly so plentiful in the island of Singapore, has long since been extinct. A few isolated trees may here and there occur, but they are very scarce, and I have not been able to obtain even the sight of one. Several of the white residents keep in their gardens, as a curiosity, a plant or two, but they grow very slowly. It must ever be a subject of regret, that on the first introduction of the Taban gum its proper name was not promulgated. Now everybody in Europe and America speaks of Gutta Percha, when, in fact, all the time they mean the Gutta Taban. The substance termed by the Malays "Gutta Percha" is not the produce of the *Isonandra Gutta*, Hook., but that of a botanically unknown tree, a species of *Ficus*, I am told. The confusion of these two names has become a popular error—an error which science will have to rectify.

The exportation of the indigenous Gutta Taban from Singapore commenced in 1844, but as early as the end of 1847 all, or at least most, of the trees had been exterminated. That at present shipped from the place is brought in coasting vessels from the different ports of Borneo, Sumatra, the Malayan peninsula, and Jahore Archipelago.† The difference existing in its appearance and properties is owing to the intermixture of Gutta Percha, Jelotong, Gegrek, Litchu, and other inferior Guttas, made by the natives in order to increase the weight. Though far from being extinct in the Indian Archipelago, Gutta Taban will every year be more difficult to obtain, as the coast region is said to be pretty well cleared, and a long transport from the interior must, by augmenting the labour, increase the value of the article.

A few months after the publication of your first account of the plant, in January, 1847, an article on the same subject appeared in the 'Journal of the Indian Archipelago,' by one of its most able contributors, Dr. T. Oxley. As that article contains many statements not contained in yours, and as it may possibly have escaped your notice, I shall make a few extracts from it.

* From Hooker's 'Journal of Botany and Kew Garden Miscellany.'

† "The total export of Gutta Taban from Singapore has been :—

In 1844	1 picul.
In 1845	169 "
In 1846	5,364 "
In 1847	9,296 "
In 1848 to the 1st of July	6,768 "
Total	21,598 piculs."

“The Gutta Taban tree belongs to the Natural Order Sapotaceæ, but differs so much from all described genera that I am inclined to consider it a new one. I shall, therefore, endeavour to give its general character, leaving the honour of naming it to a more competent botanist, especially as, from want of complete specimens, I have not quite satisfied myself regarding the stamens and fruit.

“The tree is from sixty to seventy feet high, from two to three feet in diameter. In its general aspect it resembles the Durian (*Durio Zibethinus*, Linn.), so much so as to strike the most superficial observer. The leaves are alternate, obovate-lanceolate, entire, coriaceous, their upper surface is of a pale green, and their under surface covered with a close, short, reddish-brown hair. The flowers are axillary, from one to three in the axils, supported on short curved pedicels, and numerous along the extremities of the branches. The calyx is inferior, persistent, coriaceous, divided into six sepals, which are arranged in double series. The corolla is monopetalous, hypogynous, and divided, like the calyx, into six acuminate segments. The stamens, inserted into the throat of the corolla, are in a single series, and variable in number, but to the best of my observation, their normal number is twelve; they are most generally all fertile. The anthers are supported on slender bent filaments, and open by two lateral pores. The ovary is superior, terminated by a long single style, and six-celled; the cells are monospermous. The fruit is unknown to me.

“Only a short time ago the Taban-tree was tolerably abundant on the island of Singapore, but already (middle of 1847) all the large timber has been felled. Its geographical range, however, appears to be considerable, it being found all up the Malayan peninsula, as far as Penang, where I have ascertained it to be plentiful. Its favourite localities are the alluvial tracts on the foot of hills, where it forms the principal portion of the jungle.

“The quantity of solid Gutta obtained from each tree, varies from five to twenty catties, so that, taking the average of ten catties, which is a tolerably liberal one, it will require the destruction of ten trees to produce one picul. Now, the quantity exported from Singapore to Europe, from the first of January, 1845, to the middle of 1847, amounted to 6,918 piculs, to obtain which 69,180 trees must have been sacrificed! How much better would it be to adopt the method of tapping the tree practised by the Burmese in obtaining the caoutchouc, than to continue the present process of extermination.”

NOTICES OF NEW BOOKS, &c.

'Synopsis Plantarum, seu Enumeratio Systematica Plantarum plerumque adhuc cognitarum, cum Differentiis Specificis et Synonymis selectis ad modum Persoonii elaborata. Auctore DAVID DIETRICH. Sect. V. Class XX—XXIII. Vimaræ: 1852.'

THE fifth volume of this work has appeared; and the publication, commenced in 1839, has at last been completed. At present every one is so well versed in the natural system, that a synopsis of plants enumerated according to an artificial arrangement has become impracticable; and this work, we have no hesitation in saying, will be the last universal Flora in which the principles of classification laid down by the Linnæan school have been followed out. As long as DeCandolle's *'Prodromus'* remains unfinished, Dietrich's *'Synopsis'* will be of some value. The author has not lived to see his task completed, he having died about two years ago, which in some measure must be taken as an excuse for the various discrepancies observable in the later volumes.

Hooker's 'Journal of Botany and Kew Garden Miscellany,' No. 41, June, 1852.

This number contains the following papers:—*'Description of a new Species of Amomum; by Dr. J. D. Hooker.'* *'Decades of Fungi; by M. J. Berkeley.'* *'Notes on Beloochistan Plants; by J. E. Stocks.'* *'The Tallow-tree and Insect Wax of China.'* *'Voyage of Capt. Denham, R.N.'* *'Mr. W. Gardiner, of Dundee.'* *'Death of Professor Schouw.'* Notices of Seemann's *'Botany of H.M.S. Herald,'* Balfour's *'Class-book of Botany,'* and Hooker's *'Flora of New Zealand.'*

The Amomum described by Dr. J. D. Hooker is *A. Danielli*, *Hook. fil.*, and was found on the gold coast, where the natives call it "Barsalo."

In the *'Decades of Fungi'* there are eighteen new species enumerated, completing the fourth century.

In the *'Notes on Beloochistan Plants'* descriptions of the following

species are given:—*Papaver cornigerum*, *Stks.*, *Acanthophyllum grandiflorum*, *Stks.*, *Pistachia Khinjuk*, *Stks.*, *P. Cabulica*, *Stks.*, *Dorycnium calycinum*, *Stks.*, *Caragana ambigua*, *Stks.*, *C. ulicina*, *Stks.*, *Onobrychis dealbata*, *Stks.*, *O. nummularia*, *Stks.*, *Astragalus sericostachyus*, *Stks.*, *Rhynchosia pulverulenta*, *Stks.*, *Sophora Griffithii*, *Stks.*, *Cucumis cicatrisatus*, *Stks.*, *Zehneria Garcini*, *Stks.*, *Z. cerasiformis*, *Stks.*, and *Derema aureum*, *Stks.*

The article on the tallow-tree and insect-wax of China is not signed, but evidently written by Sir W. Hooker. It appears that in an establishment at Vauxhall alone no less than one hundred tons (£7000 worth) of candles from wax and tallow of vegetable origin have been manufactured in a week. The author then proceeds to quote the interesting account of the *Stillingia*, by Dr. Macgowan, which we published some time ago. The insect-wax, or *Pe-la*, is said to be produced, according to some, by a species of *Coccus*; according to others, by the *Flata limbata*, which feeds upon an evergreen shrub, the *Ligustrum lucidum*; but even this latter point is disputed by Mr. Robert Fortune, who, we are told, in a foot-note, has brought home a deciduous tree as the true plant which yields the wax, and which is living in the garden of the Horticultural Society.

From the paragraph relating to the voyage of Captain Denham, R.N., we learn that H.M.S. 'Herald' has been re-fitted, and started for the South Pacific, accompanied by Mr. John Macgillivray as Naturalist, and Mr. Milne as his assistant. Probably no surveying vessel ever left the shores of England under more favourable auspices than the 'Herald;' and the islands which the expedition is to visit are of more than ordinary interest.

The note referring to Mr. W. Gardiner, of Dundee, is in substance the same as that printed on the wrapper of our last number; and it is to be hoped that the subscriptions for the benefit of that botanist may be numerous.

The announcement of the death of Professor Schouw is taken from a Danish paper. A biographical sketch of that illustrious naturalist will be found in a subsequent page.

Erratum.—Page 600, line 11, for "Ivemember" read "I remember."

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One hundred and thirty-fourth sitting.—Saturday, June 26, 1852.

Mr. NEWMAN, President, in the chair.

Cucubalus baccifer.

The President exhibited a series of specimens of *Cucubalus baccifer*, gathered on the 9th instant, in the Isle of Dogs, by Mr. Thomas Westcombe, of Worcester. Mr. Westcombe found the plant growing in considerable abundance, in the old station, the only one known in Britain, and thought there was no probability of its becoming exterminated.

Reproduction of Acrogens.

The President called the attention of the Club to a paper by Mr. Henfrey, published in Mr. Taylor's 'Annals of Natural History' for June, on the mode of reproduction in the higher Acrogens. He observed that the paper was one of great value, as the author had collected the observations of the principal writers on this subject, and had arranged them under the different groups to which they referred; but at the same time he regretted the entire absence, in this and all other papers on the same subject, of any attempt to systematize or classify observations with a view to philosophical deductions. It was established that certain parts of the embryo in Exogens became gradually developed into the so-called cotyledons; also that at a certain and subsequent period the germinating axis made its appearance, together with the ascending plumule and descending radicle; but no observation had yet been made that afforded any clew to the origin of this axis. In ferns, on the other hand, Nägeli and Suminski had traced, as they asserted, the origin of the plumule and radicle to the presence of what were now termed antheridia and archegonia, developed on the surface of the proembryo, which was evidently the analogue of the cotyledon. When the plants were matured the object of our attention in the respective classes was reversed; we multiplied observations on the pollen-granules and fecundation of the Exogens to admiration, but were without a single observation on the fecundation of the mature Acrogens. Thus we attempted to compare two

stories, of which we neither knew nor sought to know the beginning of one nor the end of the other.

Teesdale Plants.

The *Secretary* read the following interesting letter from Mr. James Backhouse, Jun., of York, dated June 7, 1852 :—

A week or two ago I spent several days in Teesdale, with my father. We were rather unusually fortunate in botanical discoveries, showing the importance of visiting good ground at various seasons of the year. On Cronckley Fell we found two banks covered over with *Primula farinosa-acaulis*, a beautiful little variety, evidently propagated by seed. The heads of flowers were entirely stemless, and of course so closely seated upon the leaves as to present a very curious and interesting appearance. Our next find was *Polygala uliginosa*, *Reich.*, a species new to the British Flora. On a high limestone (!) ridge, at an elevation of about 2500 feet, we discovered the rare and very beautiful *Myosotis suaveolens* (*M. alpestris*), previously known on the Bredalbane range, in Perthshire. *Alsine stricta* (*Arenaria uliginosa*) is safe and healthy on Widdy Bank Fell, but so difficult to find as to be perfectly (?) secure. *Pyrola secunda* may be *looked at* by a steady head, but that is about all. *Gentiana verna* was beautifully in blossom, studding the margins of the streamlets and high limestone pastures with its brilliant blue flowers in all directions. Its range of altitude is 1100—2600 feet. The meadows were literally pink with *Primula farinosa*, or yellow with *Trollius europæus*, in many parts; sometimes finely intermingled with *Orchis mascula* and primroses. How many more rarities will turn up in this rich district it is impossible to say; but I firmly believe that more are yet to be found.

Fritillaria Meleagris.

The President made the following observations on the unusual abundance of *Fritillaria Meleagris* :—

I know not whether any botanist has recorded the observation that the natural geographical distribution of this beautiful plant in Britain is almost exclusively confined to the Valley of the Thames and its various tributaries. Some of the recorded localities are so improbable, or so entirely unconfirmed, as to be worthy of no credit; others are almost certainly garden escapes; but the Thames localities, reaching up to the very source of that river, present every appearance of being strictly native. The unusual dryness of the past spring has been extremely favourable to the flowering of the snake's-

head; and in many places it has been more abundant than even the buttercups and daisies. In one station (previously unrecorded?) it has flowered to an extent that has attracted the attention and excited the fear of many of the neighbouring farmers; this is in meadows adjoining Oaksey Park, in Wiltshire, and two miles from the Kemble Station, on the Great-Western Railway. An eye-witness informs me that it occurred abundantly over one hundred and twenty acres of meadow, and that one piece, of sixteen acres, was entirely covered with it. The soil is described as "sandy loam mixed with clay, and abundantly saturated with water." In this meadow a considerable proportion of the flowers were pure white.

Mr. Smith's Division of Ferns.

The President exhibited a series of the rhizomes of ferns, in reference to Mr. Smith's having lately employed that part in the formation of a dichotomous division of the order. He stated that he had long since given the subject a careful investigation and consideration, and had published in the 'Phytologist,' no less than seven years ago, a summary of his views, as follows:—

"Ferns, in common with other vegetables, possess organs subserving two different purposes;—the preservation of the individual and the preservation of its kind." "In ferns, it will be at once seen that the roots tend to the preservation of the individual, so also does the stem: under all its names of root, rhizoma," cormus, "underground stem, caudex, trunk," runner, "&c., the discerning mind recognizes the same organ under a variety of forms. The fructification is obviously a provision for the preservation of the kind, and it may be remarked that it never appears in any degree to subserve the preservation of the individual, but rather tends to its exhaustion and impoverishment." "I am inclined to think the first class of organs has not received that consideration to which it is entitled; and *I could wish to see characters carefully drawn from the direction and form of the rhizoma, the attachment and veneration of the fronds, and the presence, situation or absence of distinct articulation of the stipes.*" "In *Polypodium vulgare* the joint is at the junction of the stipes with the rhizoma. I find that every discoloured frond falls off at the slightest touch, leaving a round scar on the rhizoma."—*Phytol.* ii. 275.

It would probably be asked, why, being aware of both the existence and the importance of these characters, he did not adopt them? The reply is sufficiently obvious,—because he found so great difficulty in

giving precise limits to groups founded on these characters, and had consequently returned to the old although unsatisfactory characters derived from the fructification. Mr. Smith had, however, recently ventured on the employment of the characters of the rhizome for the formation of a dichotomous division of ferns, as already indicated on the wrapper of the 'Phytologist.' He (Mr. Newman) entertained grave doubts whether a dichotomous division could be made with sufficient precision to include all the genera. The idea, which had formerly occurred to him, and which he found preserved in MS., was to make a quadruple division of the ferns.

1. Those in which the rhizome was of great endurance, of comparatively slow growth, and capable of producing single fronds from any part of its surface, except the extreme point of increase. These fronds were always articulated at the base, falling off when mature, and leaving a cicatrix like that left on the twig of an Exogen when the leaf has fallen. Hence the frond is a true leaf. Familiar examples :—*Polypodium vulgare* and *Davallia canariensis*. This group is in all probability identical with Mr. Smith's EREMOBRYA.
2. Those in which the rhizome is of less endurance, of somewhat more rapid growth, and in which the fronds, although widely separated and distinct, as in the preceding, are, nevertheless, without any basal or other articulation, and therefore do not fall like the leaves of Exogens ; but their bases remain identical with the rhizome. Familiar examples are afforded by all the Hymenophylleæ, *Pteris aquilina*, *Lastrea Thelypteris*, *Polypodium Phegopteris*, *P. Robertianum*, *P. Dryopteris*, and *P. montanum*. Adopting Mr. Smith's termination, Mr. Newman proposed to call this group CHORISMOBRYA.
3. Those in which the trunk was rather a corm than a rhizome, which was erect or suberect, which was of great endurance but of extremely slow growth, which produced fronds only from its point of increase, and in which each successive frond originated in the base of its predecessor, these bases being exarticulated and identified with the corm, or trunk. Examples :—*Filix-mas* and *Filix-fœmina*. To this group Mr. Newman proposed to restrict Mr. Smith's very appropriate name of DESMOBRYA.
4. Those in which the corm, or trunk, was succulent, the frond one only on each corm, and its vernation straight. This group, corresponding with the Ophioglossaceæ of Robert Brown, is

already universally acknowledged as natural. Mr. Newman thought that its name might be changed, for the sake of uniformity, to ORTHOBRYA.

The author observed, that in carrying out this new system some rather startling separations, as well as combinations, would be necessary. Thus, Thelypteris and Oreopteris would belong to separate groups; Polypodium vulgare and P. Phegopteris must part company, as must Cystopteris fragilis and C. montana. On the other hand, Polypodium alpestre and Athyrium Filix-fœmina could not be generically separated; neither could Polypodium Dryopteris and Cystopteris montana; neither could Polypodium vulgare and aureum. These three Polypodia would now stand out almost as types of great groups.

Pteris serrulata in Dorsetshire.

The President read a letter, addressed to himself, by Mr. J. W. Bailey, of 71, Gracechurch Street, which was accompanied by numerous specimens of Pteris serrulata, said to have been gathered on the south coast of Dorsetshire. He thought the statement required investigation, and that some mistake must have been made.

Orchis speciosa.

The President next alluded to the report, which had been widely circulated in Irish and other newspapers, of Orchis speciosa of Host having been found in Ireland by Mr. David Moore, the learned and most energetic Curator of the Glasnevin Botanic Garden at Dublin. He had corresponded with Mr. Moore and other botanists on this subject; and the following conclusions seemed almost inevitable:—1st, That the plant in question is the Orchis mascula, β , of Koch; and 2ndly, That it is not the Orchis speciosa of Host, a plant of which Mr. Babington has German specimens, with which he has carefully compared it, and finds the sepals of the Irish less acute than those of the German specimens, a conclusion with which Mr. Moore appears now fully to coincide. Dr. Lindley, however, thinks differently, and pronounces the Irish plant to be the true O. speciosa. The Irish plants are eighteen inches high, have *invariably* unspotted leaves, and look, as regards superficial appearance, very unlike O. mascula. Is the Orchis speciosa of the continent a species?

Chenopodium ficifolium.

The President read the following extract from a letter addressed to him by Mr. E. G. Varenne, of Kelvedon:—

“I am engaged in an investigation of a form of *Chenopodium* common in garden-ground &c. about Kelvedon, and which I refer to *Chenopodium ficifolium*. Have you a specimen of this latter plant, with characteristic lower leaves and perfect seed?—do you know of anybody who has such a specimen?—and could you get me two or three seeds?”

The President regretted his inability to assist Mr. Varenne, but hoped that some members of the Club would be able to do so.

Species of Woodsia.

The President read the following extract from a letter addressed to him by Mr. Wollaston, of Eltham:—

“I send you notice of an important observation I have made in distinguishing the difference between the two *Woodsias*. *W. Ilvensis*, in the commencement of its growth, or its vernal growth, is of a light bright-green colour, very scaly, and has no appearance of thecae until the fronds are nearly matured, and have attained their full growth. On the other hand, *W. alpina* is a very dark green, has very few scales, and the fronds are studded with thecae as soon as they are visible. It is about three weeks later than *Ilvensis* is in its first appearance above ground. *Alpina*, moreover, is procumbent in habit; whereas *Ilvensis* is erect.”

Arabis stricta and Trinia vulgaris.

The President read the following extract from a letter addressed to him by Miss Attwood, of 12, Clifton Vale, Bristol:—

“While searching for *Notolepeum Ceterach* on rocks near Cook’s Folly, on the Gloucestershire side of Clifton, where it grows more luxuriantly than on the opposite, or Somersetshire, side of the river, I found a fine specimen of *Arabis stricta*, which grows more plentifully in that locality than anywhere else in this neighbourhood; but I did not see our other rarity,—*Trinia vulgaris*,—although it grows on a reef of rocks at a short distance off. Should you have any friends who may particularly desire for their herbariums either *Arabis stricta*, *Hutchinsia petræa*, or *Trinia vulgaris*, I have a few duplicates which I shall have pleasure in sending.”

Nees von Esenbeck.

The President read the following letter, addressed to the Editor of the ‘*Phytologist*,’ dated Plymouth, June 7, 1852, by Dr. Hance:—

Sir,—The number of your journal for March last contained the draft of a proposed address of condolence to Prof. C. G. Nees von Esenbeck. Very many of your readers who participate with yourself in those feelings of pity for the illustrious septuagenarian which the unworthy conduct of his oppressors is calculated to inspire, must have observed with regret that no allusion has since been made to this proposed expression of sympathy; and it is even whispered abroad—with what truth I do not pretend to determine—that the project itself has been abandoned, owing to the fear entertained by some lest a show of honest indignation at a contemptible act of tyranny should give offence in certain courtly circles. It is repugnant to my disposition to obtrude myself where so many better men might take the lead; but, since no one has volunteered to come forward of late, I confess that I feel a pride in reminding the scientific world, however imperfectly, of the claims possessed by the venerable Professor to respect and admiration. For a quarter of a century the President and chief support and ornament of the first learned academy in Europe, an indefatigable and voluminous author, alike distinguished as a philosopher, a botanist, and a physician, original in his views, lucid, terse, and eloquent in his style, various and profound in his learning, of few can we say with more justice,

“Nil unquam tetigit quod non ornavit.”

It is known that the pitiful excuse put forward for Prof. Esenbeck's removal from the chair he has so long filled with distinction is a domestic event, which occurred about twenty years ago! and for which no liberal or charitable individual will now call him to account. The real motive for this arbitrary act is, however, to be found in the circumstance of his having, as a member of the Prussian Parliament, rendered himself obnoxious to a retrograde ministry, by the consistent and unwavering advocacy of good faith, reform, and constitutional government. May this be borne in mind!—the latest acts of a long life, spent, not in offering at ducal council-tables jesuitical advice how best

“To fool the crowd with glorious lies,”

but in the zealous and unremitting examination of Nature, in the study of mind and matter, consisted in an enlightened effort to advance those liberal views which render *our* position such as it is.

The suspicions mentioned above may, unhappily, be well founded; and some persons may withhold their adhesion through motives of

policy ; but such a contingency should not prevent us from offering that unfeigned tribute of respect and sympathy which the talents and misfortunes of the eminent Professor so deservedly challenge.

Let me add a few words of warning. It is our boasted privilege as Englishmen to side with the oppressed, and to express boldly our abhorrence of tyranny, whenever and wherever exercised. That an unfettered and honourable press has used its utmost endeavours to foster and maintain this feeling, we have all cause gratefully to acknowledge ; but indications of its apparent weakening in the public mind have, unfortunately, not been wanting. A new Holy Alliance has been formed ; continental Europe again groans under military despotism. Let us beware, lest peradventure our apathy in asserting the sacred principles of freedom encourage that insatiable and insidious spirit—which, knowing and dreading its enemies, persecutes and exiles the Cousins, the Comtes, the Kinkels, the Says, and the Thomas—to invade our shores, now almost the only European asylum for the victims of persecution.

I am, Sir,

Your faithful Servant,

H. F. HANCE.

To the Editor of the 'Phytologist.'

The President expressed his concurrence in the views expressed by Dr. Hance, and wished to call the attention of botanists generally to the unhappy circumstances of the distinguished naturalist to whom Dr. Hance referred, and to solicit pecuniary aid in his behalf. He had already to announce the following subscriptions, offered for that purpose :—

	£	s.	d.
William Spence, Esq.	5	0	0
C. Zeyher, Esq.	2	0	0
H. C. Watson, Esq.	2	0	0
J. S. Bowerbank, Esq.	1	0	0
Robert Wigham	1	0	0
Professor Henslow	1	0	0
Berthold Seemann, Esq.	1	0	0
James Yates, Esq.	1	0	0
Dr. H. F. Hance	„	10	0
Edward Newman	1	0	0
E. G. Varenne, Esq.	„	5	0
Bedford Pim, Lieut. R.N.	„	10	0

The Encephalartos of Southern Africa.

The President read the following memorandum on these plants :—

The important labours of Miquel and Lehmann abroad, and those of Yates in this country, have rendered the study of Cycadeæ so interesting a subject, that the following notes, extracted from a letter of Charles Zeyher, dated Cape Town, April 28, 1852, cannot but be welcome :—“*Encephalartos Frederici-Guilielmi*,” says the writer, “grows on the Winterberg, the theatre of the Caffre war, and would at present be difficult to obtain. *E. Altensteini* is found in woods on the Boschman’s River, not far from the virgin forests of Olifuntshoek. *E. tridentatus* occurs also, but sparingly, in that neighbourhood. *E. horridus* is probably identical with *E. lanuginosus*; but it requires yet some examination to decide this point finally. *E. cycadifolius* is a small and very distinct species; and there is reason to believe that *E. pungens* is likewise a good species, differing, as it does, both in its habit and locality from *E. Caffer*. *E. longifolius* is, with more reason, considered the same as *E. Caffer*. Age, and perhaps also the effect of soil and locality, make the leaflets of *E. Caffer* assume different forms which may have given rise among botanists to the creation of different species. A person possessing some tact has no difficulty in detecting among these and similar varieties the play of Nature, and discerning the true limit of species. It is not impossible, however, that *E. longifolius* does exist; but I do not remember having ever met with it, and have now been in Southern Africa upwards of twenty-five years. *E. pungens*, at least the species which I consider as such, partakes of the habit, and grows in the same soil and locality as, *E. horridus*; but the leaves are longer and regular, the leaflets oblong-lanceolate, very entire, and acutely pointed, and the stem is much higher; the cones are, in comparison with those of *E. Caffer*, more cylindrical and longer, and approach more those of *E. horridus*. I am going to examine once more all the species, in their natural state, and shall be most willing to communicate the result.”

Joakim Frederick Schouw.

The President read the following notice of M. Schouw, supplied by a botanical friend :—

Science has sustained another loss. Schouw, the great phyto-geographer, is no more; and his death is the more severely felt, as his

place is not easily re-filled. Denmark, his native country, especially has reason to weep for him; for not only did his scientific achievements shed lustre upon her, but his political labours tended to secure to her those liberal institutions which now so eminently distinguish her from the iron despotism to which France, Italy, and Germany are subjected.

J. F. Schouw was born in 1789, at Copenhagen, where his father was a wine-merchant. At an early age he exhibited a predilection for Natural History; and his thirteenth year had hardly been completed when he attended a course of lectures of the celebrated Vahl. At the University, however, he made the law his principal study, and passed a most satisfactory examination. Systematic botany had little attraction for him; and his travels, which did not extend beyond territories well explored, offered but few materials for the description of new genera and species. Neither did vegetable anatomy and physiology find in him an admirer. His taste and energies were directed more to geographical, physical, and economic botany; and it was in these branches that his genius displayed itself. The geography of plants, so happily conceived by the master-mind of a Humboldt, formed the starting-point for Schouw's scientific labours; and while yet occupying a subordinate position in the Home Office he wrote a treatise on the true native places of plants, which procured him the title of "*Doctor Philosophiæ*." Journeys through Germany, Italy, and France, undertaken during 1817, 1818, 1819, and 1820, and again in 1829 and 1830, tended to foster his inquiries, and also to familiarize him with the institutions of other countries.

In 1821 Schouw became Professor in the University of Copenhagen, and up to that time he had confined himself to scientific labours; but when, in 1830, the French Revolution broke out, and that desire for free political institutions which had made itself so prominent during the last few years began to seize Europe, he ranged himself on the side of the popular party, and was the first who ventured to establish in Denmark a periodical which advocated liberal principles, and which was conducted with so much moderation and propriety, that it soon worked its way into the most intelligent circles of society. It is not our desire to follow Schouw through his political career; suffice it to say that he was more fortunate than many of his French and German colleagues, who for a time played a similar part, and deeply suffered for their patriotic devotion on the commencement of the reaction. In Denmark the liberal party obtained the mastery; Schouw

became successively President of the National Assemblies and the Legislative Councils; "and," says a Danish paper, "the botanical Professor moved in the parliamentary forms with an ease, and conducted the discussions with an impartiality and tact, which won him the applause of all parties."

Schouw had reached his sixty-fourth year when, on the 29th of April, 1852, his earthly existence was terminated. If his native country owes him much for helping to secure to her the freedom she now enjoys, Science is indebted to him for enriching her with so many additions, and opening new fields of inquiry and research. His works are numerous, but the most celebrated are 'Tableau du Climat et de la Végétation de l'Italie,' 'Phyto-geographical Atlas,' and 'The Earth, Plants, and Man.' Schouw's fame is of no perishable nature. It has not been obtained by that species of scheming, puffing, and quackery by which many have managed to bring themselves into notice, and fancy they have succeeded in grasping the palm of immortality when they have only surrounded themselves with a mob of contemptible adulators, but by sound research, by deep philosophical arguments, and by a degree of erudition which could not fail to procure for him the place he now occupies. His body may moulder, the monuments erected to his memory fall down, but his name will stand for ever in the annals of science.

Viola stricta in Cambridgeshire.

The President read the following interesting note, from Mr. Polwhele :—

While looking for the *Viola stagnina* in the fens below Cambridge I thought I had found some fine specimens of it in White Fen; but on comparing them with a specimen of *Viola stricta* from Ireland, and the description in the 'Phytologist' for January, I was pleased to find it was that plant, as it had decidedly a short, blunt, green corolla-spur, and oblong-lanceolate stipules. I only gathered a few specimens, thinking it was the *V. stagnina*; and since that I have not had an opportunity of going for more of it; so I cannot tell whether it is abundant.

Mr. Salmon's Division of Surrey into Botanical Districts.

The President read the following note, from a botanist who wished not to have his name published, but whose high standing he (the President) would vouch for :—

Sir,—Being an inhabitant of Surrey, and possessing a slight smattering of geographical botany, I have attentively perused the article of Mr. J. D. Salmon, in which he proposes to divide this county into nine districts. Nothing is easier than drawing a certain number of imaginary lines across a piece of ground, nothing more difficult than to point out those characteristic features which distinguish one district from another. Now, as Mr. J. D. Salmon has made the readers of the 'Phytologist' follow him through about eight pages, without giving them any information on the latter point, I vote that he is called upon to show what are the characteristic botanical features of his districts, and how the districts are to be distinguished from each other phytologically.

I have the honour to be, Sir,

One who thinks that the Division of
the County has been carried too far.

To the Editor of the 'Phytologist.'

The following note, by Mr. William Bennett, on the same subject, was also read:—

In reference to the communication, in the last number, 'On the Division of the County of Surrey into Botanical Districts, with a view to the Preparation of a Flora of Surrey,' I cannot help thinking that, however useful county floras may be, as affording the materials and groundwork of a wider compendium, they can be of little other than local interest, and often disappoint the searcher after information by their extreme and arbitrary limitation. In our botanical rambles how rarely do we confine our footsteps to the boundaries of a county, especially if we wish to gain a start by the wonderful facilities of these railroad times; and of what scientific interest can it be whether a plant grows on this or the other side of some brook or streamlet, or of an imaginary line, which none but the parish authorities can trace out correctly? The irregular extent and arbitrary mapping of our counties deprive them likewise of much geographical value in respect to their natural productions. Every inland county is also shorn of its fair share in the representation by having no sea-coast. It would strike me that the counties of Surrey, Kent, and Sussex would form together an extremely natural group or division. I have not Watson's 'Cybele' at hand, to see if this is not one of his "provinces," but almost think it is identical. What a glorious Flora this district would make!—and how much more satisfactory to the student and lover of Nature, and of how much more scientific interest and value, to see spread before him a complete bill of fare of a natural division like

this, than if confined to the accidental limits of the county of Surrey alone. I think we have strength enough to work out such a Flora, with the industrious and zealous co-operation of the botanists residing in different parts of these associated counties; and I put it to Mr. Salmon, to whom the county is so much indebted for the discovery of many of its rarities, nevertheless, to sink, if not too late, the idiosyncrasy of this favourite county into something more cosmopolitan.

Adonis autumnalis, &c.

The President read the following note, by Mr. James Hussey, of Salisbury:—

Some very just remarks, from your lamented correspondent, the late Dr. Bromfield, appeared some time back in the ‘Phytologist’ (Phytol. iii. 317, 416), reprobating a habit contracted latterly by British botanists, of considering certain plants to be doubtfully indigenous upon insufficient grounds. Now a note upon *Adonis autumnalis* in the ‘Phytologist’ for March (Phytol. iv. 470) affords a good instance of this peculiar proneness to doubt; for if we consider the reasons there given for supposing *Adonis autumnalis* to be “probably not truly wild,” they are these:—First, that it grows in cultivated fields; and secondly, that it cannot be depended on two seasons following. Upon referring to writers upon plants, whether ancient or modern, it will be seen that *Adonis autumnalis* is always described as growing in corn-fields and cultivated land in France, Belgium, Switzerland, Italy, and Spain. That it should be found, then, only in corn-fields in England, is no more than was reasonably to have been expected. Cultivated land is its natural station, in common with many other plants; and its occurrence there can consequently be no reason against its being indigenous. But then “it cannot be depended on two seasons following.” Now with regard to this, there are unknown causes operating, which tend to keep some plants scarcer than others; but in the present instance it is, besides, obvious that plants growing in cultivated land are more liable to disturbance from the rotation of the crops than those in other positions, and so do not appear in the same profusion every year in the same place; but this fact is scarcely available to prove that a particular plant is not a native, because it applies with equal force to *Ranunculus arvensis*, *Centaurea Cyanus*, *Papaver hybridum*, *Bupleurum rotundifolium*, and others which are at present free from the brand of an asterisk. Moreover, if the observations of the late Dr. Bromfield upon *Oenanthe pimpinelloides* and *Silaus pratensis* (Phytol. iii. 405—408), and of Mr. Lees in a paper

devoted to the subject of "the disappearance of plants from localities once assigned to them" (Phytol. iii. 510), be correct, there are many other plants undoubtedly native which are far from constant to their position. In the case of *Adonis autumnalis*, however, my own experience would lead me to affirm that, though varying in abundance in accordance with the variation of the crop, it is always to be found in its old localities; and this observation Mr. Flower also verifies in the note referred to, as, though rare, he still found a few specimens in the corn-fields of Kent, where it had been, a few years before, abundant. The second reason, then, is no more satisfactory than the first; for, supposing *Adonis autumnalis* to be "probably not truly wild," a plant which is known to have been found in corn-fields in England more than two hundred years ago (see Parkinson, as quoted by the Rev. W. T. Bree); which is widely distributed over the counties with a chalky or limestone soil from Gloucestershire to Norfolk and Kent; which grows, too, in the most upland and solitary spots, such as Stonehenge and Great Ridge, in this county; which has been received without a note of doubt by Ray,* Hudson, Sir J. E. Smith, and, I believe, all botanists until very lately; and which has no peculiarity in its geographical range upon the Continent to make its occurrence in England unlikely; it may well be matter for surprise that an asterisk should ever have been affixed to it in an English Flora, when the balance of probability inclines so very decidedly in favour of retaining this ornament of our corn-fields upon the list of our truly native plants.

Athyrium ovatum.

The President read a short paper intituled :—

"Note on *Athyrium ovatum*, *Roth*, more especially in reference to a Paper by Mr. Hort, published in the 'Phytologist' for February (see Phytol. iv. 440); by Edward Newman."

On reading the paper to which I have referred above, and which was first published in the 'Botanical Gazette,' I did not perceive that it contained any observations that required a reply at my hands; I regarded it only as an agreeable contribution to a favourite science; and as such I applied for and received permission to transfer it from the pages of a moribund periodical to those of a journal still in the prime of its green and vigorous age. I am aware that my nature is

* Unless the "in Angliâ sponte provenire dicitur sed rarius" of Ray be considered to imply a doubt.

extremely sluggish and obtuse in comprehending anything that partakes of the character of criticism on myself; but this, I am now informed, was Mr. Hort's intention; indeed, I learn that he is considered as having made rather a good hit on the subject of *Athyrium ovatum*, when he explains that Fries used to make a point of having seen at least a hundred living individuals of a plant before he admitted it into his Catalogue, but that no one would fix the numerical standard so low as two, the number to which, as far as his observation extends, *Athyrium ovatum* is restricted in its British locality. Hence it would appear that I have introduced a species on the faith of these two examples.

I would first reply that my correspondents did not inform me of the fact of this restriction; from their communications I was induced to consider it "rare" (*Phytol. App. xii*); but I never entertained the idea of its numerical restriction to two or two hundred individuals; indeed, a botanist now at my elbow, and one whose judgment in the matter of ferns is paramount, says, "I saw it frequently, though not abundantly, throughout the lake district." The communicant has the plant growing luxuriantly. I may also mention that Hoffmann and Roth, from whose works the species is adopted, make no allusion whatever to its rarity. I am induced, by my friend already alluded to, to mention this subject, because I have no ambition to be ranked among species-makers; and, moreover, the regulation laid down by Fries for his own government is altogether so congenial to my views, that I cannot but regard with some feeling of complacency the fact that twelve years ago I published an idea identical with that which is now cited.

As a botanical observation I would add, that the flat upper surface of the pinnules of ferns has always a tendency to parallelism with the horizon. If the rachis also possess this parallelism the plane of the pinnæ and of the rachis is identical; but when, as in bog-ferns, the rachis is erect or nearly so, then the pinnæ, still striving after the horizontal position, form nearly right angles with the rachis. The peculiarities recorded by Mr. Hort are results of these general laws. When the reverse takes place that position may be regarded as exceptional.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, May 13, 1852.—Dr. Sellar, President, in the chair.

A note was read from the Rev. W. A. Leighton, transmitting specimens for the Society's herbarium of a new fungus, detected by the

Rev. A. Bloxam, on fallen firs at Gopsall, Leicestershire, and named by the Rev. M. J. Berkeley, *Patellaria constipata*.

Dr. Balfour read a letter from Dr. Dickie, mentioning that he had added two mosses to the Flora of Ireland, not recorded in Mackay's 'Flora Hibernica,' viz., *Polytrichum hercynicum* and *Hypnum rufescens*, "northern forms, and associated with the Spanish forms, so called by Professor E. Forbes."

Dr. Balfour also read a letter from Professor M'Cosh, in which he remarks:—"You may be interested to learn that I was with Dr. Dickie and his students to-day on their botanical excursion. We had two goniometers with us. We cut off a number of healthy branches from various trees on our route, and made a number of measurements, the students being the agents. The results correspond wonderfully with those arrived at by me. Taking a fair, healthy branch, with branchlets, we measured so many as eight or ten of these branchlets, I mean the angles made by them; and then, working the sum by 8 or 10, what I have given below is the normal angle, as thus determined:—*Rosa canina*, 50.5; alder, first trial 47.5; ditto, second trial, 51; privet, 51.52; horse chestnut, 51; ash, 58.5; beech, 44; briar, 48; elm, 45; sycamore, 45; *Stellaria media*, vein and branch, 20. Such observations as these are to be repeated every Saturday during the season."

Dr. Balfour exhibited the following donations, made to the Museum of Economic Botany since the last meeting of the Society:—From His Grace the Duke of Buccleuch:—Section of a cedar of Lebanon, eighty-two years old and seven feet in circumference. From Mrs. C. Macintosh, Stockbridge:—Two baskets, "Yellon and Binnok," made by the natives of Melbourne, South Australia. From Isaac Bayley, Esq.:—Box from the West Indies, made of beef-wood (a species of *Casuarina*); also specimens of straw and straw-plait from Shetland; and various specimens of ropes. From — Hay, Esq., Leith Ropery:—Specimens of hemp in various stages of manufacture. From Miss M'Nab, Zante:—Specimens of the Corinthian grape and bottle-gourds. From John C. Wilson, Esq., manufacturer, Kirkcaldy:—Specimens of flax in various stages of manufacture. From Mr. Charles Howie, nurseryman, St. Andrews:—Specimens of carboniferous fossils, consisting chiefly of *Stigmaria* and ferns. Some of the specimens of *Stigmaria* were very large, and presented the true characters of the genus in some cases, while in others they seemed to pass into the form of *Sigillaria*. From Miss Dewar, Dundas Street:—Specimen of what appeared to be a portion of a palm-spathe. It

had been received from Naples, as the cover of an orange-box. From Dr. Hay, 74, Queen Street:—Specimens of “Tappa,” or Sandwich-Island cloth, said to be made from the leaves of *Pandanus*. It is “made by hammering the leaves so as to run the fibrous matter together. The specimens were made in the district of Kan, in Owhyhee. The dye of the coloured specimen is also native.” Also a piece of silicified wood from California. From John Watson, Esq., Calcutta:—Handkerchief made from pine-apple fibre. From Mr. Maclean, Braidwood:—Specimen of paper made from flax, grown upon his farm at Braidwood, in the season of 1851. “The one sample is mixed with a little refuse from the flax-mills, Dundee; the other is entirely from the flax-straw. The one specimen is pressed, the other is not.” From Michael Connal, Esq., Glasgow:—Specimens of the following plants, from the Botanic Garden, Calcutta, preserved in pyroligneous acid:—Fruit of *Borassus flabelliformis*, papaw (*Carica Papaya*), netted custard apple (*Anona reticulata*), three species of *Dolichos*—*D. gladiatus*, *tuberosus*, and *Lablab*,—and *Spondias mangifera*. From George Graham, Esq., through Humphrey Graham, Esq.:—Specimen of Kauri resin, accompanied with the following observations:—“From the *Dammara australis*, or the *Pinus Kauri* of New Zealand, according to Mr. Yate, who describes the tree as running from eighty-five to ninety feet high, without a branch, and sometimes twelve feet in diameter, yielding a log of heart-timber eleven feet in diameter. In 1838 it appears that some cargoes of this timber were received at Plymouth dock-yard, and that the wood was found of admirable quality for masts and spars of ships. Mr. Prideaux, of Plymouth, sent a paper on the Kauri resin to the ‘Philosophical Magazine,’ in 1838, in which he pointed out its valuable qualities for varnish-making. It appears that Captain Cook first noticed the tree in New Zealand.”

The following papers were read:—

1. ‘Notice of Chinese Vegetable Products;’ by Robert Fortune, Esq. Mr. Fortune, in transmitting specimens for the Museum of Economic Botany, sent the following remarks in regard to them:—

“1st. Eight samples of curious kinds of tea, some made up in bundles, or balls, others in cakes of different sorts. With reference to the two large cakes, I have the following memorandum from the Rev. Dr. Bridgeman, of Shanghae, from whom I received them:—‘They are from the province of Yunnan. It is called “dragon conglomerate tea;” and it is considered valuable for its medicinal qualities, being used for fever and ague, and other similar diseases. A piece as large

as the end of a man's thumb, with a small bit of ginger, is to be boiled in water, and then taken as the Chinese take the ordinary tea.'

"2nd. Seeds of the Chinese tallow-tree (*Stillingia sebifera*). It will be observed that these seeds are coated with a tallow-looking substance. This is, in fact, the vegetable tallow, an article which is extensively used over the whole of China, and particularly in the central and more northern part of the empire. The seeds, after the tallow is removed, also furnish oil, which is much used; and the refuse, or oil-cake, is employed in manuring the land.

"3rd. Green-tea dyes. These are gypsum, turmeric, and Prussian blue (two kinds). They are taken from a tea manufactured in the green-tea country, where they were being used in preparing tea for our depraved tastes. In my new book I have given a full account of this manufacture.

"4th and 5th. Two kinds of arrow-root made from the root-stocks of *Nelumbium speciosum*. This substance is held in high esteem by the Chinese, and is extensively used in the central parts of the empire.

"6th. A noble specimen of the fingered citron, from China.

"7th. A bottle of fruit of *Gardenia radicans*. It furnishes a yellow dye, used in colouring wood. The dye is boiled with a small portion of glue, rubbed on the wood, which is thus oiled over. The wood is much used for ornamental work, and for boats.

"8th. Liquid indigo made from *Isatis Indigotica*, largely used in the northern province of China. It is the Tein-Ching of the Chinese, and is used exclusively in dyeing cotton-cloth. It is much in use in China. It is produced in a district near Shanghae, and is hence called Shanghae Indigo.

"9th. Specimens of the fibre of the hemp palm (*Chamærops* sp.). This is a most beautiful palm-tree. It grows in the northern province (Chekiang and Kiangnan), where the winters are excessively cold, and where other tropical forms of vegetation are unknown. It produces large quantities of the brown fibre on its stem, which is probably intended by Nature to protect it from cold. These trees are very valuable to the natives, who remove a quantity of fibre from them every year. Its fibre, as in the sample sent, is converted into ropes, cables for junks, and brushes; hats and cloaks are also made of it, and worn in wet weather by the agricultural labourers and others. It makes excellent bottoms for beds and couches, and is used in many other ways. I believe it is much more hardy than any of its tribe; indeed, it has been living in the open air at Kew for some years. Sir Wil-

liam Hooker, to whom I sent plants in 1848, says, in the 'Botanical Magazine' for March, 1850, that it 'has braved unharmed, and unprotected by any sort of covering, the severe winters now passed (1849—50.)' We may therefore hope to see this fine palm growing on our hill-sides as it does in Northern China, particularly in the milder parts of England, Ireland, and about Edinburgh."

2. 'On Plants found in Yorkshire, Westmoreland, and Cumberland, in April, 1852;' by Mr. James B. Davies. Mr. Davies remarked:—"The past spring has been a remarkably dry one; but on the 28th, 29th, and 30th of April there was a plentiful supply of rain in Yorkshire. The long period of drought had a remarkable effect in retarding vegetation, not so much, certainly, in the neighbourhood of the lakes, where the air is moist, as in the mining districts of Westmoreland, where the ground is more heathy. For ten weeks prior to the 28th of April not half an inch of rain had fallen. I left Ripon on the 1st of April, for Harrogate, and on the common found *Luzula pilosa* in good condition, with roses, *Pelargoniums*, and *Cinerarias*, in the gardens. I spent five days at Poole, where I found the apple, pear, and cherry in flower, with daffodils, gooseberries, currants, *Anemones*, *Saxifrages*, and the red variety of *Pulmonaria officinalis*, in the gardens. On a hill at Ilkley I saw an abundance of *Lycopodium clavatum* and *Bryum ligulatum* in fine fruit. On Good Friday I found, in the grounds around the Abbey of Bolton, and between that and Barden Tower, the wild strawberry, marsh marigold, *Cochlearia*, *Oxalis acetosella*, *Chrysosplenium alternifolium*, *Jungermannia epiphylla*, and *Marchantia conica*; and *Lathræa squamaria* at Pooley Bridge. At Kettlewell, *Saxifraga tridactylites* was abundant on the scars. On the 14th of April, *Sesleria cærulea* was noticed at Kirby Stephen, in Westmoreland, with *Prunus spinosa* abundantly in flower. The leaves appeared on the 27th. At Temple Laverby on the 16th and 17th a few new plants were noticed—*Ranunculus auricomus*, *Alchemilla vulgaris*, *Myosotis sylvatica*, *Luzula sylvatica*, *Plantago lanceolata*, two flowers of *Lychnis dioica*, *Poa annua*, *Linaria Cymbalaria*. On a hill near Pooley Bridge I found *Primula farinosa*, not in flower; and in a dried drain *Ranunculus hederaceus*, with flowers not half the diameter of the ordinary form, probably the result of drought. On the way from Pooley to Keswick, I found, on the 21st of April, *Lotus corniculatus*, *Chenopodium Bonus-Henricus*, *Stellaria Holostea*, and *Orobus tuberosus*, all in flower; large patches of *Allosorus crispus* in the crevices of the walls. Friar's Crag is a little rocky promontory, which juts out into the north-east side of the lake. Here the broom and blaeberry were in fine flower, as well as woodroof, *Anthoxanthum*,

bird-cherry, and *Cerastium triviale*. *Epimedium alpinum* is not now found here. On the grounds facing the river Greta, I found *Luzula campestris*, crow-garlic, ash, earth-nut, germander speedwell, *Galium cruciatum*, *Ajuga reptans*, *Vicia sepium*, and *Alopecurus pratensis*. Mr. Davies likewise gave a complete list of the plants observed by him, with their dates of flowering.

Professor Balfour exhibited a young plant of *Victoria Regia* from one of the hot-houses in the Botanic Garden, showing the remarkable difference in the form of the leaves produced in its early stage of growth from those afterwards formed. The plant showed the first-formed linear leaf, followed by the sagittate form, after which leaves of a more or less rounded-cordate form are produced.

A number of interesting exotic plants, in flower, were exhibited from the hot-houses in the Botanic Garden; also many alpine plants, including rare British species, such as *Carex Vahlia*, *atrata*, &c.; and plants of *Viola stagnina* and *Ranunculus tripartitus*, which had been presented to the garden by Mr. Babington.

The following gentlemen were elected Ordinary Fellows:—Rev. Thomas Brown, Randolph Cliff; Christopher Kerr, jun., Esq., 22, Walker Street; Peter Davidson, Esq., 39, Albany Street; Peter Fairbairn, Esq., 53, George Square.

After the meeting the members enjoyed a walk through the palm-house and hot-houses of the Botanic Garden, along with Professor Balfour.

Thursday, June 10, 1852.—Dr. Sellar, President, in the chair.

The following donations were announced to the Society's library and herbarium:—‘Transactions of the Tyneside Naturalists' Field-Club,’ from the Club; British plants from W. Somerville Miller, Esq.

Dr. Balfour exhibited, under the microscope, a section of fossil dicotyledonous wood, from California (presented by Dr. Hay), exhibiting a peculiar arrangement of the woody zones.

Dr. Balfour mentioned the following donations, which had been made to the Museum of Economic Botany at the Botanic Garden since the last meeting of the Society, and exhibited some of the more interesting specimens:—From Mr. Hepburn, Millfield:—A monstrous cucumber, in which a flower was produced from the side of the fruit. From George Patton, Esq., of Cairnies:—Sections of stems and roots of Scotch fir, larch, common spruce, and white spruce, showing peculiar arrangements of the woody circles. In some cases the rings, from pressure, were developed chiefly on one side of the central point; in

others there were several centres shown, with concentric circles round each. From Mr. Brand :—Specimen of an adulteration of green tea, said to be composed chiefly of the excrement of the silk-worm.

Mr. M'Nab called the attention of the Society to "a magnificent specimen of the *Lilium giganteum* of Wallich, or *L. cordifolium* of Don's 'Flora Nepalensis,' now flowering, for the first time in Britain, in the Comely-bank Nurseries, from seed originally sent home by Major Madden, collected in the damp shady woods of Kemaon. The plant at Comely Bank is now nine feet six inches high, and in flower. Major Madden has just informed me that this gigantic lily grows at between 7000 to 9000 feet of elevation, in deep, black, vegetable soil, and averaging from five to eight feet in height, the bulbs being always found on the surface of the soil."

The following papers were read :—

1. 'On a supposed new Species of *Eleocharis*;' by Charles C. Babington, M.A. The plant described by Mr. Babington had been picked in the autumn of 1844, by Professor Balfour, at Taynlone, in Cantyre, along with *Scirpus pauciflorus*. Among specimens of the latter plant transmitted by Dr. Balfour, Mr. H. C. Watson had detected the new species to be noticed. The species has been denominated *Eleocharis Watsoni* by Mr. Babington, and is thus described :—Spikes terminal, solitary, oblong; glumes acute (?), the lowest one somewhat blunt, and surrounding the base of the spike; style bifid; the achene convex on both sides, oblong, very obtuse, with its base slightly attenuated, the angles rounded and obscurely punctate-striated, the base of the style persistent, broadly depressed; 4-6 hypogynous setæ shorter than the achene; culms sheathed at the base, the sheath abruptly truncate. Mr. Babington, after giving fuller details respecting the plant, made some remarks on the difference between it and the allied plants, *viz.*, *Eleocharis uniglumis*, *E. multicaulis*, and *E. palustris*; and he expresses an earnest hope that some botanist will visit the locality in Cantyre, and determine more completely the character of the species, which at present rests on the examination of three or four specimens only. The paper was illustrated by a specimen of the plant, from Professor Balfour's herbarium.

2. 'Analysis of the Fluid (known as gram-oil) from the Leaves of Gram (*Cicer arietinum*);' by Thomas Anderson, Esq. This paper consisted of an analysis made by Mr. Russell Aldridge. "On evaporation it yielded a black residue, which would not dissolve in cold water, but did so readily when heated; and on cooling it became turbid, showing the presence of oxidizable extractive. To a small por-

tion of the fluid was added chloride of calcium, and obtained a precipitate of oxalate of lime, showing the presence of oxalic acid ; it was then filtered ; and to a portion of the filtrate potash was added. No precipitate was obtained, and therefore no tartaric acid. To the remainder of the filtrate was added ammonia, which gave no precipitate when cold ; but upon boiling it a slight one was obtained, showing a trace of citric acid. The remainder of the original solution was evaporated down, and the residue taken up with alcohol. A small quantity of gummy matter separated. On evaporating the alcoholic fluid down it left some sugar. The residue was then placed in a platinum capsule, and subjected to red heat. The ashes (which were of a brown colour) were then taken up with water, and a few drops of hydrochloric acid added, which gave to the fluid a yellow colour, showing the presence of oxide of iron. It was then filtered, and carbonate of ammonia added, which gave a distinct trace of lime ; filtered again, and to the filtrate was added phosphate of soda, which gave a trace of magnesia. Potash and soda were present in minute quantities. The results are :—Oxalic and citric acid (copious traces), oxidizable extractive, gum, sugar, lime, magnesia, iron, potash and soda."

3. ' Notice relative to the Transmission of Foreign Seeds in Soil ;' by Mr. M'Nab. The author of this paper stated that he had long been in the belief that the transmission of fruits and seeds in a fit state for germination would be better accomplished by being packed in soil than by any other known method. This experiment was fully tested by himself in 1834, when he brought over the seeds of many of the rarer American oaks and other trees in boxes filled with soil ; while portions of the same kinds of seeds, packed both in brown paper and cloth bags, were in many instances totally useless. The method he adopted for the American tree-seeds was as follows :—He purchased several strong deal boxes, about fourteen inches in diameter, and made of $\frac{3}{4}$ inch wood. He afterwards procured a quantity of soil, taken from a depth of eight or ten inches under the surface, so as to possess only a natural dampness. A layer of the soil, two inches deep, was placed on the bottom of the boxes, above which a layer of seeds was distributed ; another layer of soil, and then seed, and so on till the boxes were full. The whole was pressed very firmly down, when the lids were nailed on, allowing no possible room to shake about. When they reached Edinburgh, in December, 1834, the seeds and soil were sown over the surface of shallow pans and boxes. During the following spring they grew freely ; while of those brought home in the paper and cloth bags comparatively few of the varieties grew, the acorns

being, without an exception, perforated with insects. The kinds which grew were from four to five weeks later of vegetating than those brought home in soil. Acorns brought home in a box of Sphagnum moss, after the superfluous moisture had been wrung from it, were equally successful with those in soil. Owing to the success of the above experiment, Mr. M'Nab, some years ago, recommended to the Highland and Agricultural Society, through the late Dr. Neill, to encourage, by means of premiums or otherwise, the transmission of seeds in soil. This was accordingly done; but nothing has resulted from it, notwithstanding that the notice still exists in their premium-list. During the summer of 1851 Mr. M'Nab induced his brother, Dr. M'Nab, of Kingston, Jamaica, to send a box of West-Indian fruits and seeds, to be put up as described, and which he despatched during the month of August, containing seeds of the following:—Granadilla, gourds, forbidden fruit, shaddocks, sweet sop, sour sop, Cherimoyer, Sapota, guava, Lignum-vitæ, papaw, alligator pear, mango, ochra, fustic, &c. The box reached Edinburgh last October. Shortly afterwards the seeds and soil were sown over the surface of boxes prepared with drainage and soil for the purpose. During the month of January the surface of the boxes became covered with innumerable specimens of cucurbitaceous and other herbaceous plants. When about three inches high they were removed; and again the surface became covered with ochra, papaw-trees, &c.; and now the different species of Anona, Citrus, Lignum-vitæ, besides several of the stronger hardwooded sorts, are making their appearance. It would be very desirable, in all cases where seeds are transmitted in soil, to have small portions of each named and sent in paper. Many of the seeds could thus be picked from the soil and identified before sowing. This, however, is only applicable to the larger fruits and seeds; while with the smaller ones dried specimens would be the only way to identify them. Two of the boxes were exhibited to the meeting; and the luxuriant growth of seedling plants which they contained bore unmistakeable evidence of the success of the mode recommended by Mr. M'Nab.

4. 'On a Variety of the *Orchis mascula* (*O. speciosa*, *Host*) found in the county of Wicklow;' by Mr. D. Moore, of Glasnevin. This communication consisted of the following letters, from Mr. Moore, relative to the *Orchis speciosa*, *Host*, which Mr. M'Nab read to the meeting:—

"May 27, 1852.—I have just been looking over a proof figure of *Orchis speciosa*, *Host*, for English Bot. Sup. It was discovered by me and another person, last year, in the Co. Wicklow, where I went

again a few days ago, and found two more plants. Koch makes it a variety of *O. mascula*, which it probably ought not to be kept separate from, the difference being more in appearance than in well-defined characters. It is, however, a noble-looking plant, growing nearly eighteen inches high.

“*May 28, 1852.*—I herewith send you one of the smallest specimens of the *Orchis speciosa*, *Host*, which I will thank you to show to Dr. Balfour. Some of the flowers in the rachis are imperfect, wanting the labellum. The specimen figured had also imperfect flowers, which would appear to be characteristic of the species. I confess I cannot find good characters to distinguish it from *O. mascula*, though it differs so widely in general appearance.”

In regard to the *Orchis*, Dr. Balfour read the following communication from Mr. Babington:—“I see that Mr. Moore has sent you a paper upon the supposed *Orchis speciosa* of the county of Wicklow, and that it is to be brought before the Botanical Society, on Thursday next. He has been so good as to send me a specimen of the plant; and I have informed him very recently that I could not concur in the opinion that it is the *O. speciosa* of *Host*. I believe it to be nothing more than a very luxuriant state of the *O. mascula*. A few days since I found two specimens, exactly corresponding with the Wicklow plant, in the wooded part of the Devil’s Ditch, in this county of Cambridge. They possess the remarkable size of Mr. Moore’s plant, and the rather acuter segments of the perianth, such as he finds on his specimens. The true *O. speciosa* (which is itself only a variety of the *O. mascula*) has very much more attenuated segments of perianth. It is figured by Reichenbach in his recent elaborate volume upon the *Orchidaceæ* (forming *Icon. Fl. Germ.*, vols. 13 and 14); and I have lately received a plant which is much more like it than is the Irish plant, from Mr. Keys, of Plymouth. Our English *O. mascula* is noted by continental botanists as an obtuse-petalled form of the species. Mr. Moore’s plant is far nearer to the continental type of the species.”

5. ‘On Plants observed in Westmoreland and Cumberland, in May, 1852;’ by Mr. James B. Davies. Mr. Davies recorded the flowering of the following plants during the month:—*Arabis hirsuta*, *Anthriscus sylvestris*, *Nuphar lutea*, *Trifolium pratense*, *Chelidonium majus*, *Primula veris*, *Bromus mollis*, *Caltha palustris*, var. *radicans*, *Trollius Europæus*, *Geum rivale* (with yellow flowers), *Melica uniflora*, *Potentilla Tormentilla*, *Ranunculus hederaceus*, *Carex dioica*, *Juniperus communis*, *Valeriana dioica*, *Caltha palustris*, var. *minor*, *Arum*

maculatum, *Primula farinosa*, *Cerastium triviale*, var. *holosteoides* (?), and many other plants. Mr. Davies observed a few ferns, such as *Hymenophyllum Wilsoni* and *Allosorus crispus*; also *Lycopodium alpinum*, &c.

Mr. Stark exhibited a new adaptation of the simple microscope, suited for field-examination of the minute parts of plants, especially for Algæ and other cryptogams. Besides the lens, supported on a stalk, for holding in the hand, and giving a power of 60 or 70, there is attached a circular glass field for laying the object on, which, if in a moist state, may be covered by another circular disk of thin glass; by a screw and spring attached the focus can be conveniently regulated. The whole is very portable, going into a neat case, about four inches by one in measure.

Mr. Evans exhibited, from the Experimental Garden, a few interesting alpine plants, and a small species of *Plantago*, raised from Californian seeds.

Mr. M'Nab exhibited, from the Botanic Garden, two tree-ferns, introduced from the West Indies, by Mr. John Kent. They appear to be undescribed, and are both very prickly.

Mr. M'Nab also exhibited, from the Botanic Garden, a number of rare and interesting plants, including a complete set of Robertsonian Saxifrages, *Marsilea quadrifolia* in fructification, *Carex Grahmi*, *Hieracium alpinum*, with a very woolly capitulum and broadly obovate leaves, *Aceras anthropophora*, &c.

John Anderson, Esq., of 41, St. Andrew Square, was elected a Fellow.

BOTANICAL SOCIETY OF LONDON.

Friday, June 4, 1852.—Dr. J. E. Gray, F.R.S., President, in the chair.

Various donations to the library were announced.

Mr. P. F. Keir communicated a paper, being 'Notes of a Botanical Ramble on the South-east Coast, in April, 1852,' which led to some discussion.—*G. E. D.*

MICROSCOPICAL SOCIETY OF LONDON.

March 17, 1852.—Geo. Jackson, Esq., President, in the chair.

L. S. Beale, Esq., Dr. Hamilton, and C. C. Smith, Esq., were balloted for and duly elected members of the Society.

A paper by Geo. Shadbolt, Esq., entitled ‘Hints on the subject of Collecting Objects for Microscopical Investigation,’ was read. In this paper the author gave a brief account of the mode of collecting Diatomeæ, Desmidiæ, and other Algæ. He also mentioned several localities where such objects are to be met with, more particularly noticing the neighbourhood of Northfleet and Bromley, in Kent. He described the necessary apparatus, and also pointed out the various appearances assumed by the objects sought for. He also gave many useful directions as to the mode of securing them when found.

Mr. De la Rue described an instrument, constructed by Mr. Peters, for producing minute writing on glass. Specimens of the writing were afterwards exhibited to the meeting.

April 28, 1852.—Geo. Jackson, Esq., President, in the chair.

R. Shuter Boswell, Esq., the Rev. W. Read, Robt. Ceeley, Esq., Dr. Kingsley, and Jas. Hilton, Esq., were balloted for and duly elected members of the Society.

A paper by J. B. Simonds, Esq., ‘On the Occurrence of a Membranous Cell, or Cyst, upon the Olfactory Nerve of a Horse, containing a large Crystal of Oxalate of Lime,’ was read. In March last a pupil of the Royal Veterinary College found, on dissecting the brain of a horse, a small, transparent cyst, possessing a very bright or glistening aspect, attached to a portion of the olfactory nerve. It was supposed to be an hydatid; but upon examining it under the microscope, with a two-inch object-glass, a large octahedral crystal of oxalate of lime, with beautifully-defined facets, was seen floating freely in a limpid fluid which distended the walls of the cell. The exact size of the crystal was not stated; but it can be very readily seen by unassisted vision. The author concluded with some observations on the frequent occurrence of carbonate of lime in herbivorous animals, and the rarity of the production of oxalates.

May 26, 1852.—Geo. Jackson, Esq., President, in the chair.

F. C. T. Roper, Esq., E. W. Cooke, Esq., and Henry Coles, Esq., were balloted for and duly elected members of the Society.

A paper by George Busk, Esq., entitled 'Some Observations on the Structure and Development of *Volvox globator*, and some allied Unicellular Plants,' was read. Mr. Busk stated that his observations had been chiefly made on *Volvox globator*, *V. aureus*, *V. stellatus*, and *Sphærosira Volvox* of Ehrenberg. These he believed to be all different forms of the same organism. He called attention to the structure of these objects, and more especially as regarded some points alluded to by Prof. Williamson in a paper recently published by that gentleman on that subject; and while in some respects he expressed a different opinion from Mr. Williamson, he fully agreed with him that they were truly of vegetable origin, and not animals. This he considered as proved, both by their structure and their chemical composition. Thus, on testing their tissues with iodine and sulphuric acid he had discovered in them both cellulose and starch. The analogies of their development with that of *Protococcus nivalis* and of *P. viridis* were very strong, as also with the supposed animalcules called *Euglenia viridis*. The author expressed his belief that the whole of the *Monadinae*, the *Cryptomonadinae*, and the *Volvocina* of Ehrenberg belonged to the vegetable rather than to the animal kingdom.

A second paper, by Mr. Mummery, of Dover, 'On the Development of the Young in *Tubularia indivisa*,' was read. The author, taking advantage of his residence on the sea-shore, where these zoophytes abound, has for a considerable period attentively watched the development of the ova; and the results of his observations form the subject of the present paper. The various changes in the ovum, from its first development to its arrival at perfection, were minutely described; and when the creature is liberated its future basal end appears first. It emerges slowly, withdrawing its tentacles in succession until it sets itself at liberty. In this state it is not fixed, but free, and may be seen crawling slowly upon the bottom of the vessel containing it, and elevating itself on the extremities of its eight tentacles. After a period of time varying from one to four days the animal, which in its free condition has never been remarkable for activity, having selected a suitable stone, or the surface of an old polypidom, reverses its position, and attaches itself, with the mouth upwards, by the opposite extremity, and soon increases in size, and attains its usual form and characters, never removing from its place after having once rooted itself.—*J. W.*

DUBLIN NATURAL HISTORY SOCIETY.

At the usual monthly meeting of this Society, held on Thursday, after several zoological papers had been read,

Mr. Kinahan exhibited a plant of a fern, a variety of *Polystichum aculeatum*, found by him at Bohernabreena, county Dublin, in 1849, which in 1850 was handed over to the care of the College Botanical Garden, where it had thriven, but had not exhibited seed-vessels as yet, though possessing a tendency to throw out bulbillæ. Mr. Kinahan remarked on the general redundancy of form in the ferns, and exhibited specimens, and referred to this as the only known example of the reverse, and gave the following statement:—"The example of *Polystichum aculeatum* now submitted to your Society is curious, as being an exception to the law which seems generally to prevail among the ferns as regards varieties. These generally differ from the typical plant, by having something added to them, either an actual expansion or a subdivision of the typical parts. Of this we have a very good example in those varieties of *Athyrium Filix-fœmina*, to which the name of *viviparæ* has been given, in which we find tassels appended to the pinnæ. We also have a good example of it in the variety of *Polystichum angulare* obtained at Ballinteer, in this county, in which, as you see, the pinnæ, particularly near the upper extremity and the frond, are enlarged, so as to give a more expanded appearance to the entire frond. Now let us contrast these with the variety to which I first drew your attention, as the great difference must strike you at once. In this we find the broad pinnæ of the type replaced by narrow, linear leaflets in some of the fronds, resembling spines or points; while in others they have totally disappeared, especially at the upper half of the frond, which in many presents a long filament, totally destitute of any pinnæ. These appearances have continued constant under cultivation, as must be evident if we compare the plant now with these fronds taken from it in August, 1849, when I found it growing on slate rocks by the side of the stream which, running through Frairstown-House demesne, falls into the Dodder just above Bohernabreena. This glen seems favourable to the growth of varieties, as I also obtained there these specimens of *Aspidium Filix-mas*. Varieties of fern are, indeed, commoner than many think, in particular places abounding almost to the exclusion of the ordinary type. Thus, at Kilmaganny, county Kilkenny, the variety of the common hart's-tongue, to which the name of *ramosum* has been given, is far commoner

than the ordinary undivided form. This is curious, as many have denied its being anything but a garden variety. The variety of *Polystichum* to which I first drew your attention has, I stated before, continued constant under cultivation. It has not, however, produced any trace of fructification, though this year some of the fronds show a tendency to produce germs in the axils of the pinnæ. In conclusion, I beg leave to draw your attention to these fine specimens of *Asplenium marinum*, some fronds of which are twenty-four inches in length, bearing on them pinnæ of two inches dimensions, which far exceed any I have met recorded in either this country or England. They were obtained at Foxe's Cove, Ballymacarte, county Waterford, in holes in the sea-cliffs, and when growing furnished one of the most beautiful examples of vegetable beauty I ever saw."

Three Days in Tilgate Forest: a Botanical Ramble.

By MESSRS. JOHN LLOYD and MCENNES.

STARTING from Croydon by the train, shortly after 7 o'clock on the morning of June 14, with the rain falling in torrents (a beautiful prospect for enjoyment amid the wilds of Tilgate), which continued till we had passed the tunnel at Merstham, we then found the sun tipping the hills with its splendour, and the Gatton Woods looked magnificent. On all sides vegetation looked luxuriant, and fast recovering from that torpidity with which it had long been struggling, from the past unusual season. A few observations upon the geology of the line may be not unacceptable to those unacquainted with the district.

How well the geological formations are defined and characterized between Croydon and the Three Bridges Station of the Brighton Railroad (the termination of our distance by rail), those only can appreciate who may have traversed that portion of the line. Starting from Croydon, the tertiary formation is somewhat level; and then the first appearance of the great chalk range does not call for any particular remark. The plants noticed there are only of the commonest kind, as *Daucus Carota* &c. Upon issuing from the tunnel cut through the chalk, the great escarpment appears very conspicuous. Many parts are clothed with a vegetation peculiar to the dry subsoils. Witness the fine, undulating appearance of the woods at Gatton, seen upon the right hand of the line as soon as you pass

the tunnel. Near here is dug the material known as hearth-stone, belonging to the upper green-sand formation.

Immediately below the chalk, stretching east and west, in a sort of valley, is the gault formation, forming one of the richest wheat-growing lands in the country. A short ride onward, and we pass the lower green sand, known by the cutting at Red Hill Junction. This being a dry soil, the beech flourishes here also. *Lotus corniculatus* was making its appearance on the edges of the cutting. We are now on a totally different formation,—the wealden clay,—presenting low, wet lands, marked, as a distinctive feature, by the almost exclusive appearance of the oak in the hedge-rows and coppices. Numerous pits of stone are seen, of a far harder texture than the red sandstone, and of some portions containing large quantities of small shells, known as the Sussex marble. Another vegetation appears in the distance: it is Tilgate Forest, situate upon the formation known as the Hastings sand, where large tracts of spruce and larch fir, encircled by an undergrowth of birch and heath, occur. Leaving the rail at Three Bridges, we proceeded over Pound Hill, into the Balcombe and Cuckfield roads. The wind was still, and the trees and underwood still covered with abundance of drops of water from the recent rain. A copse half a mile distant from Pound Hill, on the right hand side of the road, looked inviting. On entering we were soon attracted to *Luzula Forsteri*, *L. pilosa*, and *L. campestris*, β . *congesta*, Hook., (but which Babington, in the first edition of his Manual, calls *L. multiflora*), *Carex glauca*, *C. sylvatica*, *C. vesicaria*, *C. remota*, *C. flava*, *C. vulpina*, and *C. stellulata*. Good states of *Galium palustre*, β . *Witheringii*, *Habenaria bifolia* (plentiful), *Juncus bufonius* and *J. effusus* were among the most conspicuous. *Aira cæspitosa* and some other grasses were advancing; but vegetation, upon the whole, seemed more backward than usual at this period of the year. Nearer to Balcombe we noticed *Ranunculus hederaceus*, β . *grandiflorus*, and *R. circinatus*. In water by the sides of the roads, and at the edge of the forest, we observed several specimens of *Aquilegia vulgaris*. On proceeding up the first hill, on the road towards the 'Norfolk Arms,' we found *Epipactis purpurata* very fine and abundant, *Orchis maculata* very large, *Listera ovata*, and *Gymnadenia albida* abundant. To the right of the road, in pools of water, was growing abundance of a species of *Myosotis*, apparently totally different from any described species. It is about six or nine inches in height, producing remarkably large blossoms, and certainly an annual; and, what is peculiar, the majority of the plants produced white blossoms. Few ferns presented themselves previous to entering

the Forest ; the only kinds were *Lastrea Filix-mas*, *L. Oreopteris*, and *Blechnum boreale*.

On entering the forest-gate opposite the ' Norfolk Arms ' we steered westward ; and the scenery then presenting itself was beautiful in the extreme. A real forest of ferns, as far as the eye could reach, composed of the beautiful, delicately-coloured, and fragrant *Lastrea Oreopteris*, the plants in many places exceeding three feet in height. It would have been impossible to have selected a more suitable time for our journey, as far as regarded ferns ; and we wished that all who study this beautiful portion of the vegetable kingdom could view them under as favourable an aspect as ourselves, and in their native habitats ; such opportunities assist more than the most elaborate descriptions in dispelling the confusion of ideas now exhibited in some of our books as to the specific limits of our native ferns. Never was *L. Oreopteris* seen in such abundance and luxuriance as at this time, accompanied and intermixed with *Athyrium Filix-fœmina* in endless variety. Allied to *A. Filix-fœmina*, occurred a species perhaps identical with that described by Mr. Newman in his ' Synoptical Table ' as *Athyrium convexum*, which he describes as having " the rachis *often* beautifully coloured with purple or red." This we believe to be a constant character, and that in this species the rachis is always so coloured. We had decided it to be a species previous to our knowledge of Mr. Newman's having named and described it as such. The period of vernality in *A. convexum* is invariably two or three weeks later than in *A. Filix-fœmina*. We found *Lastrea spinosa* abundantly in most parts of the Forest. When growing in the bogs it assumes an appearance a good deal resembling that of its near ally, *L. uliginosa*, its pinnules often becoming decurrent. It is desirable to caution the young botanist who may find it under such circumstances, from mistaking it for that much rarer plant. In the same localities, and often closely approximate, we found *Lastrea multiflora* ; and to us it seems impossible that any one should confound this with *L. spinosa*. Nothing can be more dissimilar, even at a distance, than these two most distinct species ; *L. spinosa* rarely attaining a height of two feet, while *L. multiflora* generally averages between four and five, and sometimes greatly exceeds the latter. They grow together, in a light, loose soil, for which both evince a decided liking. *Lomaria* or *Blechnum* was plentiful enough, but *Filix-mas* was rarely to be seen, excepting here and there a large plant, standing, like a sentinel, on the outskirts.

The favourite habitat of *L. Oreopteris* appears to be near the banks of streams or on somewhat moist soil, always showing a decided

preference for that composed of a rich loam. We noticed a curious circumstance in connexion with this species and *A. Filix-fœmina*. On the back of a stream running east and west these two species were located very characteristically. The south side of the glen, having a north aspect, quite open and exposed, from near the edge of the stream, extending three or four yards upwards, was covered exclusively with *A. Filix-fœmina*; while the opposite side of the stream, having a south aspect, was covered in a similar manner by *L. Oreopteris*. Not a plant of any other kind was visible. The contrast of the yellow green foliage of one and pale green of the other was very striking. In the valleys *Veronica palustris* [? *Ed.*] was very luxuriant, *Wahlenbergia hederacea* plentiful, and *Narthecium ossifragum* just making its appearance. The previously-named *Myosotis* was here again plentiful, and, as before, almost invariably white.

After spending several hours in this district we shaped our course towards Balcombe. About a mile thence, on the right of the road, we observed *Fragaria elatior* plentifully in hedges; also *Scolopendrium vulgare* and *Lastrea Filix-mas*. Proceeding towards Cuckfield, we noticed *Viburnum Opulus* just expanding. *Erodium cicutarium*, *Asplenium Adiantum-nigrum*, and *Scolopendrium* were very fine and plentiful.

Reaching Cuckfield at half-past 6, we examined the church, expecting to find some good ferns; but in this we were disappointed. The north side was quite bare, a few small plants of *Asplenium Trichomanes* being all the ferns met with, except a plant of *L. Filix-mas* and *Polypodium vulgare*. The tower was clothed to its very summit with *Parietaria officinalis*, *Leontodon Taraxacum*, *Achillea Millefolium*, &c. A few plants of the *Achillea* were on the west side of the tower. On a wall on the north side of the town we observed *Sedum acre*; and *Asplenium Ruta-muraria* was lining the under portion of the coping-stone, a station it seems partial to. In a lane leading south-east from the town of Cuckfield, upon the wealden clay, on the opposite side of the Forest Ridge to that previously spoken of, we found most luxuriant growths of *Polystichum angulare* and *P. aculeatum*, accompanied by *Scolopendrium vulgare*, on the hedge-banks. Of the form of *aculeatum*, known more generally as *lobatum*, we found several plants. This seems to be a young state of *aculeatum*. This was, indeed, the spot for a lesson on ferns and their culture. We had just concluded our ramble at sunset, and retraced our steps to the inn.

The next morning, the 15th, we left Cuckfield, at 4 a.m., for the Forest. Nothing of any note was observed till we reached the interior

of the Forest. Here *Carduus palustris* presented itself, and also *Hypericum Androsæmum* plentifully. In a somewhat shady portion of elevated ground, at a distance of about two miles from Balcombe, and near the line of the tunnel, we had the good fortune to find *Polypodium Phegopteris* in the most beautiful condition. The fronds were unusually large and luxuriant, averaging when measured, together with the long, naked rachis, more than two feet in length. Its luxuriance and delicate colour combined to render it a beautiful and truly-interesting object. This fern, though occurring plentifully in the northern and north-western counties, is excessively rare in the southern and eastern, only one Sussex habitat having been previously recorded, *viz.*, near Forest Row, as recorded in Newman's 'Ferns,' p. 118. In the Balcombe locality it occurs in large patches, and is a most interesting addition to the Flora of this delightful neighbourhood. In marshy ground near the same spot we observed *Anagallis tenella* in fine order, accompanied with abundance of *Ranunculus Flammula*.

Heavy storms of rain now compelled us to turn for Balcombe; and, having taken refreshment at the Railway Inn, we proceeded to the rocks known as the Forest Ridge. This is the central or anticlinal axis of the wealden, formed of the upheaved rocks belonging to the Hastings-sand formation, which are conspicuous for the peculiar forms caused by the continued action of water during their upheaval. In a copse about a mile south of Balcombe, upon the extreme top of some perpendicular rocks, were some fine trees of *Pyrus Malus*, certainly wild. The roots were in many cases quite exposed, hanging in festoons, and some of the roots projecting through the interstices of the stone, and forming young trees. In water near here we observed *Potamogeton natans*, *P. plantagineus*, *P. heterophyllus*, *P. perfoliatus*, and *P. crispus*. *Equisetum fluviatile* was also very fine. On the main ridge of rocks *Hymenophyllum Tunbridgensis* is in a sad condition, from the dryness of the spring. It is nearly all dead at present, although the late beneficial rains may restore the roots. *Lastrea recurva* occurred in plenty, and very fine. Can it be a fact that this has been confounded with either *L. multiflora* or *L. spinosa*? Nothing can be more conspicuous than the differential characters of the two species, even at the greatest distance. In the first place, *L. multiflora* was growing at the base of the rocks, side by side with *L. recurva* and *L. spinosa*, thus affording a fair opportunity for comparison; *L. multiflora* exceeding five feet six inches in height, while its delicate and sweet congener, *L. recurva*, did not exceed eighteen inches. Its beautifully incurved pinnules are so plainly observable, that all

doubts must instantly cease on examining them. One obvious character in this species is the much greater length of the right hand lower pinnæ, generally with an extra division, and its distinct colour. Besides, it is, truly speaking, a rock-fern, a character which appears constant, as far as we have been able to judge, both here and at Ardingly. The smallest plants, only an inch and a half in height, and having only a second leaf, were readily distinguishable. *Incurva* seems a more appropriate name for this species. The small form of *L. multiflora*, called by some *L. dumetorum*, was abundant in many places.

We next directed our course for the Chiddingly Rocks, where we found *Hymenophyllum Tunbridgensense* tolerably good, and *L. recurva* plentifully, and growing exclusively in the crevices of the rocks. Near them we found a few plants of *Ranunculus* (? *Lingua*), and in the hedges *Prunus domestica*, certainly in a very wild situation. We found a single plant of *Neottia Nidus-avis*. *Luzula sylvatica* was abundant in many places.

The intensely heavy rain till late on the morning of the 19th prevented our very early movement. On the sandy banks we found *Sedum acre*, and in stronger soils *S. Telephium*. Several of the ferns again presented themselves, as *Polypodium vulgare*, *Blechnum boreale*, and *Scolopendrium vulgare*, and as we approached the heavy soils, fine plants of *Polystichum angulare* and *P. aculeatum*. Near Turner's Hill we found *Asplenium Adiantum-nigrum* and *A. Trichomanes* on a sand-bank. Taking the road towards the 'Norfolk Arms,' on a wall of sandstone on the edge of the Forest we observed a state of *Ranunculus*, agreeing certainly with Mr. Babington's description of *R. ophioglossifolius*. It is probably nothing more than a form of *R. Flammula*. As we approached the Forest, *Lastrea Filix-mas* was again at his post on the outskirts and in the hedge-banks. We now retraced our steps to the Three Bridges, and were soon on our way to London.

J. LLOYD, K. McENNES.

July, 1852.

On the Nag-kassar. By BERTHOLD SEEMANN, Esq.*

THE fragrant flower-buds imported under the name of *Nag-kassar*, or, more correctly, *Nag-kessar*, the name being a corruption of the Sanscrit words *Naga* and *Kesara*, have been referred by Dr. J.

* From the 'Pharmaceutical Journal.'

Pereira ('Pharmaceutical Journal,' vol. x. p. 449) to *Calysaccion longifolium*, *Wight*, and by Dr. W. G. Walpers ('Botanische Zeitung,' vol. ix. p. 367) to *E. Chinense*, *Wlprs.* This difference of opinion has arisen from a discrepancy in the description of *Calysaccion* in the 'Illustrations of Indian Botany.' Dr. R. Wight there describes the peduncles as short, the stamens as submonadelphous, and the connectivum as truncated. Dr. Walpers found that those terms could not be applied to the buds which he examined, that the peduncles were long in proportion to the flowers, the stamens entirely free, and the connectivum acute. Hence he concluded that the buds must belong to another species, which, thinking China to be its native country, he called *Calysaccion Chinense*.

Having examined a number of buds, and also some specimens in Sir William Hooker's herbarium, I became convinced that the differences were not such as would justify the establishing of a new species, the stamens being in fact sometimes quite free, sometimes submonadelphous, and the connectivum truncated and acute in one and the same flower. One point of difference, however, still remains between Wight's description and the buds. "No one," says Dr. Walpers, "would call a peduncle which is more than half an inch long short in proportion to the flowers." But this discrepancy, apart from the fact that short and long, broad and narrow, are merely relative terms, must be regarded as a mistake, which even the most painstaking naturalists are apt to make. The specimens in Sir William Hooker's herbarium leave no doubt that the peduncles are proportionately long; and the buds may therefore, without hesitation, be considered as the produce of *Calysaccion longifolium*, *Wight* (*C. Chinense*; *Wlprs.*).

The buds are about the size of a pea, and of an orange-brown or cinnamon colour. They emit a fragrance not unlike that of violets or green tea; and Dr. Pereira has suggested that on account of this odour they might be valuable as a perfume. Their chief use, however, and that for which they are employed in the East Indies, is dyeing silk. What colour they produce is not known, but it is probably yellow. My esteemed friend A. Hanbury, Esq., says, in a letter to me:—"A decoction of the *Calysaccion* buds possesses, I find, but very little colour, as the enclosed slip of blotting-paper, which has been dipped into it, will show. If, however, a little subcarbonate of potash be added to this simple decoction, a tolerable deep orange-brown is produced. The piece of calico sent, having been steeped in a weak solution of alum, was boiled in this alkaline decoction; but the

buff colour it has acquired is not remarkably fine. Perhaps some one acquainted with dyeing might succeed in producing a better hue."

The genus *Calysaccion* is allied to *Kayea*, *Wall.*; and the only species as yet discovered is *C. longifolium*, *Wight*, a beautiful tree, found in abundance on the top of the Malabar Ghauts in the Southern Mahratta country, in the West Mysore and Coorg, on the Parell and Worlu Hills, Bombay, and in the Kennery jungles. The leaves are opposite, oblong, coriaceous and evergreen. The flowers appear in March and April, and are produced in clusters on the old wood; they are whitish-yellow streaked with red, and polygamous. The male plant is called *Woondy*, the female *Poonag*; while both are known by the names of *Suringee* and *Gordeoondy*. The term *Nag-kessar*, which is applied to the buds in commerce, is given to them in India in common with those of several other *Clusiaceæ*.

An improved generic character of *Calysaccion* has been published by Dr. Walpers (*Bot. Zeit.* vol. ix. p. 367); and all required now to complete our knowledge of the plant is a description of its fruit, and some information about the dye which the buds produce, and the mode of extracting it.

Occurrence of Orobanche cærulea, Vill., and *Aconitum Napellus*, L.,
in Monmouthshire. By F. J. A. HORT, Esq.

ON the 2nd of this month I had the pleasure of finding a single specimen of *Orobanche cærulea*, *Vill.*, by the side of a lane a mile or two south-west of Chepstow. A plant of *Achillea Millefolium*, *L.*, grew two or three inches off; and, as none of the other usual victims of the broomrapes were to be seen, that was doubtless the sufferer, although I failed to trace the connexion. This discovery gives probability to the record for Glamorganshire in the 'Swansea Guide' (see *Cyb. Brit.* ii. 231).

A week previously I had gathered *Aconitum Napellus*, *L.*, to which I had been directed in the spring. About two miles to the west of Chepstow is the southern end of a winding rent in the carboniferous limestone hills. A more secluded valley can hardly be imagined, except in a mountainous country. In the lower part the stream turns several paper-mills; but as you ascend you soon become clear of them, and of all habitations. The bottom of the highest reach of the valley is occupied by a rough pasture, on the west side of which the

stream winds under brushwood. The monk's-hood grows here in several places among the bushes on the top of the bank. It may give some idea of the vegetation to mention that the steep sides of the valley are covered with native coppice, rich in yew and whitebeam, out of which rise here and there rugged crags of limestone. The neighbouring woods contain *Carex digitata* and *Melica nutans*. I must add that the stream does not rise in the valley, but flows into the head of it, from the scattered hamlet of Itton; and two or three cottages have potato-gardens sloping down to the bank. Under these circumstances it is impossible to affirm that the monk's-hood may not formerly have been cultivated in the village, and some knobs of the roots carried down the stream, a distance of about half a mile. And such would be my own conclusion, if there were any strong *à priori* reason against *A. Napellus* being native, beyond the certain fact that in most places where it now looks wild it is a relic of old cultivation. It is native in France, in Germany as far north as the Eifel, in Denmark, and in South Scandinavia. We have (Cyb. Brit. i. 98) the opinions of competent persons in favour of its nativity in three counties on the borders of Wales, one of them in Monmouthshire. And the subalpine character of the locality would seem favourable to its production. We must remember that if cultivation has introduced some plants it has destroyed others; and the valleys where the native vegetation is rich and undisturbed are comparatively few and ill-explored. On the whole, therefore, I am inclined to support the claims of *A. Napellus* in Monmouthshire, though thinking it but just to describe minutely the circumstances of its occurrence, as others might judge differently from the same evidence. It would be interesting to examine the glens of the forest district between Chepstow, Newport, and Usk; but unfortunately that is not in my power this summer.

F. J. A. HORT.

Note on the Third Volume of Mr. H. C. Watson's 'Cybele Britannica.' By F. J. A. HORT, Esq.

MR. WATSON, in the new volume of the 'Cybele' (p. 428), adds "province l" to the area of *Circæa alpina*, on the authority of a list published by me in the 'Phytologist' nearly five years ago. I am bound to lose no time in publicly begging him to cancel this statement, as I ought perhaps to have done long ago. The specimen is

now lost ; but I remember some time after it was gathered coming to the conclusion that it was probably only *C. Lutetiana* with more cordate leaves, more membranous sepals, and more delicate texture than usual. The list was drawn up at a time when I was acquainted with no other botanist, and had no adequate sense of the importance of extreme accuracy and certainty in publishing information. Hence the list is a very unsatisfactory one. The records of *Linaria repens*, *Nepeta Cataria*, and perhaps *Cochlearia anglica* were absolute blunders. I should now likewise exclude, except as naturalized, *Konigia maritima*, *Reseda fruticulosa*, *Erodium moschatum*, *Phalaris canariensis*, and *Medicago falcata*. I certainly saw either the last-named plant (see *Cyb. Brit.* iii. 406) or *M. sylvestris*, which was not then distinguished from it in England, but gathered no specimen. The plant looked wild enough ; but its genuine nativity is very questionable, except on the drift-sand of the high ground of E. Anglia. I have since been at Weston, but not at the precise spot. *Eryngium campestre* I still believe to be truly native there ; but the lower ground near the sea has many introduced plants ; and it is said that seeds have been intentionally sown within the last year or two.

As my name occurs several times in the ‘*Cybele*,’ in connexion with critical plants, perhaps I may be forgiven for saying that the use of a particular specific name does not *necessarily* imply any belief as to the distinctness of species. Any one who is more anxious to form a true than a rapid judgment must take, for a time at least, the nomenclature of some recognized authority on trust.

F. J. A. HORT.

Trinity College, Cambridge,
July 21, 1852.

NOTICES OF NEW BOOKS, &c.

‘*Cybele Britannica*. Vol. III. By HEWETT COTTRELL WATSON.
London : Longman and Co. 1852.’

WE have rarely, perhaps never, met with a preface or introduction to a scientific work so truthfully explanatory as Mr. Watson’s “*Explanations Introductory to the Third Volume of the ‘Cybele Britannica.’*” We are therefore glad to avail ourselves of the critic’s privilege of quoting largely from the author’s published exposition of his own objects and intentions.

“The third volume of the ‘Cybele Britannica’ will continue and conclude the distribution of species treated singly; and in so far it will be simply a continuation and conclusion of the two former volumes. A second portion of this volume will be devoted to such corrections and additions as increased knowledge may have rendered necessary, in reference to the distribution of the species treated in those former volumes. The distribution of the whole series of species will thus be brought down to the end of the year 1851. If sufficient space shall then remain, without rendering the volume inconveniently bulky, a tabular summary will be introduced, designed to compress the leading facts of species-distribution into a more condensed and selected condition, for the use of Botanical Statists.

“Thus far, the three earlier volumes of ‘Cybele Britannica’ will differ much from the fourth and final volume. In the concluding volume it is proposed to treat the distribution of plants under a different aspect; that is to say, not each one singly and apart, but the whole taken in connexion; in order that their individual peculiarities of distribution may appear in comparison and contrast, as reciprocal illustrations of each other.

“The causes that now continue the existing distribution of plants over the surface of the earth, or those that have originally and gradually determined their distribution, are too wide in their influence, to admit of being properly treated in a work devoted to the plants of one small country, and to their distribution within that limited space only. Should the Author have life and leisure to carry out his present wishes, and enduring inclination adequate to the task, he may perhaps write a ‘*British and Foreign Cybele*,’ for the purpose of tracing the distribution of British species over other parts of the earth, and of showing the true relation borne by the flora of Britain to the floras of neighbouring countries. The causes or conditions of their distribution might then appropriately find place and room in a work of that more comprehensive, and necessarily less detailed, character. His investigations have not hitherto led him to adopt the current opinion (or, rather, mere guess) that the flora of the British islands has been derived from the opposite countries of the Continent,—at least, not to any greater proportionate extent, than the floras of those countries may be said to have been derived from Britain. Interchange has most likely taken place; Britain giving, as well as receiving.

“It is not expected that the fourth volume of ‘Cybele Britannica’ can be published within two years from the date of the present volume, if so early as only two years after. That contemplated fourth

volume would of course be founded upon the facts detailed in the three earlier volumes ; indeed, such a volume might now be made by a connected and comparative re-arrangement of the same details. But there is still much that bears upon the subject, remaining unpublished and unarranged among the Author's notes in manuscript, or even confined to the still more precarious keeping of his own personal recollections. He therefore wishes and hopes to be enabled to write a fourth volume, to complete a work on which he has bestowed no small share of his time and attention ; while fully aware that the completed work would still be far from exhausting the subject.

“ But in case any circumstance should prevent that contemplated fourth volume from ever being written, the three earlier volumes of ‘ *Cybele Britannica* ’ may even then be considered in the character of a completed (though much narrowed) treatise on the distribution of plants in Britain. It would still constitute an advanced ground or foundation, upon which a more perfect construction might be raised at some future time, and by some other hand. The chief difference in the present work would be, that the facts remained only in arranged details, instead of having been first investigated and shown in detail, and then grouped together connectedly, to illustrate their geographical relations to each other.

“ The ‘ *London Catalogue of British Plants*, ’ published for the Botanical Society of London, is still used as an Index to the series of species in the ‘ *Cybele Britannica*. ’ It will not be difficult to keep in recollection, that the names and numbers of the species, in each successive volume of this work, will be found to correspond with those of the three successive editions of the ‘ *London Catalogue* ; ’—the first volume, with the first edition,—the second volume, with the second edition,—the third volume, with the third edition. Though the names and numbers of the species are nearly uniform in the three editions, progressive knowledge and altered views led to some few changes therein, and additional species unavoidably caused the insertion of several duplicate Nos. Hence, too, some duplicate Nos. and other corresponding changes in the ‘ *Cybele Britannica* ’ also.

“ Another coincidence may be found elsewhere, which it is worth while to point out, because geographical botany has very close dependence on the department of descriptive botany. The three successive editions of Mr. C. C. Babington's ‘ *Manual of British Botany* ’ bear the dates of 1843, 1847, and 1851. The three volumes of ‘ *Cybele Britannica* ’ are dated in 1847, 1849, and 1852, having been written or partially printed in the years preceding their publication. In each

case their publication followed that edition of the Manual which corresponds numerically with the volume of the Cybele.

“Thus, the state of our knowledge in the elementary or descriptive department of British botany, at the dates of each volume of this work, may be ascertained from the corresponding edition of the Manual, and from no other publication of the same class. The Manual continues to be decidedly the best descriptive Flora of Britain hitherto published;—a very good model having been copied in its plan and general composition,—the best authorities in European botany having been regularly and fully consulted,—and each successive edition having been attentively revised. Moreover, it is the work of a botanist who is much better acquainted with the plants of the British islands, than was the Author or Editor of any other Flora of Britain without exception.”—*Introductory Explanations*, pp. 1—4.

All that we can add of this valuable work may be expressed in a few words. We know of no publication, on any subject or in any language, on which more labour has been judiciously and continuously expended. Information concerning each species is brought up to the latest possible date; and the quotations from the recently-published pages of this and other journals show that the author keeps pace with information, let it be diffused through whatever channel it may. This is the only way to obtain credit among those who are at work in the same science; and select of Mr. Watson's works which you will, it is a matter of certainty that no better, no more precise, information exists at the date of its publication.

K.

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Thirty-fifth Sitting.—Saturday, July 24, 1852.

MR. NEWMAN, President, in the chair.

Polypodium Phegopteris.

The President exhibited remarkably fine fronds of this fern, found near Balcombe, in Sussex, and wished particularly to invite the attention of the readers of the ‘Phytologist’ to that rich and almost unexplored district. An interesting paper on the botany of Balcombe and its vicinity would appear in the August number of the ‘Phytologist.’

Athyrium latifolium.

The President read a note intituled 'Reply to Mr. Newman's Observations on *Athyrium latifolium*,' (Phytol. iv. 618) from the pen of Mr. Hort, dated Trinity College, Cambridge, July 21, 1852:—

Some kind friend, it would appear, has half persuaded Mr. Newman that I have been taking foul advantage of his unsuspecting innocence, and indulging the readers of the 'Phytologist' in the rare treat of a laugh at its Editor behind his own back. The guile must have been infused into my paper with truly exquisite skill, for it has been till now imperceptible to myself, as it was to Mr. Newman's own good sense in the first instance. I have only to say that I (rightly) supposed him not to be aware how extremely few roots of the *Athyrium* were known to exist, but wished to give both him and other botanists such materials for a right judgment as I could supply.

It is surely not usual in matters of science, whether in the 'Phytologist' or elsewhere, to accept unauthenticated statements; so that at present I must demur to our anonymous friend's theory of a plurality of roots. I examined hundreds of *Athyria* in various parts of the Lake district during a stay of some weeks, but saw nothing like *A. latifolium*; and Miss Wright, the discoverer, had met with no better success in several years. The identity of the continental plants with our own must be somewhat more securely established than it is at present, before the supposed abundance of the former can be allowed to make up for the scantiness of the latter. My friend Mr. Carter has in his possession two fronds of the var. *molle* which show a considerable approach towards *A. latifolium*, but are much smaller and weaker.

Mr. Newman may possibly be right in disallowing my suggestion as to the plane of the pinnæ in *Lastrea cristata* &c.; but the theory which he substitutes is hardly likely, I should think, to meet with much favour.

Narcissus aurantius?

The President read the following note, from Mr. Thomas Clarke, of Bridgewater, dated Halesleigh, July 14, 1852:—

The notice in the 'Phytologist' for June (Phytol. iv. 600) of *Narcissus incomparabilis* having been found wild in Yorkshire, has reminded me of the finding of a nearly-allied species in Somersetshire, and in a situation very like that described for the Yorkshire plant. In the spring of this year, while walking through a field on the western side of the village of Churchill, near Axbridge, in which N.

Pseudo-narcissus was growing abundantly, and *N. biflorus* rather sparingly, I observed a *Narcissus* differing from both; and on going to it I found it to be a species which, in its double form, is very frequent in gardens. I believe it to be *N. aurantius*, or *Queltia aurantia* of Haworth's Monograph, the corolla being of a full, clear yellow, and the nectary orange, both nearly as deep in colour as the corresponding parts of the well-known variety of *N. Tazetta* named *Soleil d'Or*, and much deeper than the figure of *N. incomparabilis* of Bot. Mag. 121. I observed but one tuft with flowers, and of these all but a very few were withered; but there were other tufts of leaves which, from their colour, seemed to be of the same species. The field is contiguous to an old farm-house, and to the village church; and although *N. biflorus* is not plentiful here it grows abundantly in a neighbouring field. *N. Pseudo-narcissus* is plentiful in many places in the district.

New Form of Myosotis palustris of Withering.

The President read the following note, from Mr. J. B. Davies, of Keswick, dated July 10, 1852:—

I lately sent to the Botanical Society of Edinburgh specimens of a *Myosotis* found very abundantly by me during last month, in the neighbourhood of Derwentwater Lake, at the same time stating it as my belief that if it was not the true *M. palustris* that plant was nowhere, so far as I could learn, to be found in Cumberland. A few days ago, however, I came upon the normal form, which seems to be later in coming into flower than that about to be mentioned. The essential characters of *M. palustris*, I need scarcely state, are, "teeth of calyx *short*, triangular; lobes of corolla slightly emarginate; pubescence of the stem *spreading*."* In no other of the large-flowered forget-me-nots have we the short, triangular, calycine segments; so that this character alone is sufficient to distinguish it from all other plants of the same genus, without the extra *essential* of the spreading pubescence on the stem. My plant wants this last character, a peculiarity which I have nowhere seen noticed. The characters of the variety might be expressed thus:—"Calyx open in fruit, shorter than the pedicels, with straight, adpressed bristles; teeth *short*, triangular; limb of corolla flat, longer than its tube, *lobes slightly emarginate*; style about as long the calyx, which is divided one-third of its length;" *pubescence of stem adpressed*. That portion of the description marked

* The portion of the stem here meant is from the root upwards to about the middle of the stem, all parts above this being usually covered with adpressed pubescence.

with inverted commas applies to the *species* as well, and is taken from Mr. Babington's Manual; while the half sentence, "*pubescence of stem adpressed*," marks the distinction of the *variety*. Of the abundance of this form I am well assured. The only wonder is that it has not been observed before. It is to be met with by the bank of the River Derwent, in marshy ground by the lake of the same name, a little way up Skiddaw and Helvellyn, and in many other places, generally, though not always, preferring drier situations than the normal form. Yesterday I found both within a yard of each other, and could observe no marked difference in the general appearance, save that the foliage of the variety had a lighter hue. Presuming, then, that a plant, occurring plentifully in many situations, differing in one *essential* character from the species with which in all other respects it agrees, is entitled to be looked upon as a good variety, I propose to call it *Myosotis palustris*, β . *appressa*.

The President said he had taken the liberty to send the specimens accompanying the letter to Mr. Watson, who had examined them, and obligingly returned them, with the following note:—

The *Myosotis* sent to you by Mr. Davies, from the neighbourhood of Derwent Water, has been known to me several years, and occurs in various counties of England and Scotland, as well as on the Continent. I possess no authentic specimen of the *M. strigulosa* of Reichenbach, quoted by Koch under *M. palustris*, and distinguished only by the three words "*pilis caulis adpressis*." Possibly Reichenbach may have intended the same variety as that sent by Mr. Davies. But the specimen from Mr. Davies himself has not the pubescence of the lower portion of the stem strictly "*adpressed*," although it is less spreading than in *M. repens*, or than is perhaps usually seen in *M. palustris*, when this latter is not destitute of pubescence below. From the typical *M. palustris*, as seen by pits and streams in the south of England, this variety differs slightly in three or four particulars, and so far shades off towards *M. cæspitosa*; but it has the elongated style of the former, with which also it more closely corresponds in other respects.

Botrychium Lunaria.

The President exhibited a specimen of *Botrychium Lunaria*, found by Mr. Broughton, between Barmouth and Hendre-yr-Coed, and kindly communicated to him.

Viola stricta in Cambridgeshire.

The President read the following extract of a note from Mr. Babbington :—

“ I regret that Mr. Polwhele has been in such haste to record the occurrence of *Viola stricta* in the fens. I believe the plant will not prove distinct from *V. stagnina*; and, moreover, I believe that the Irish plant will turn out to be the same.”

The President read four extracts from a note received from Miss Attwood, of Clifton.

Dianthus cæsius.

I have been much interested in the recent discovery of a patch of *Dianthus cæsius* growing on St. Vincent's Rocks. It had hitherto been supposed to be confined to the limestone cliffs at Cheddar; but this, from its healthy appearance, promises to spread. It was confined to one spot in an opening of the rocks; and there was still a flower and seed-vessel upon it. It is in an accessible place to those who are not timorous, but a little out of sight below the Clifton Observatory. I have heard that some ladies, a few years back, brought seeds from Cheddar, and planted them on the rocks, but that they did not succeed in their endeavour to propagate it. Whether this patch is a remnant of their experiment I cannot say; but it is, I believe, the only specimen to be found out of gardens in the neighbourhood, and was a very agreeable surprise to me.

Poa polynoda.

This plant I find in three places in this vicinity—on a wall in Clifton; at the foot of St. Vincent's Rocks; and about a mile lower down.

Pyrus Aria.

This tree is common on the rocks, but chiefly on the Somersetshire side. There is also a variety of it, which I submitted to an eminent botanist, who considers it interesting, as forming a *link* between *P. Aria* and *P. Scandica*.

A Flora of Bristol.

A Flora of Bristol is now in preparation, by a gentleman residing in the neighbourhood—Mr. Swete; and I should think it would prove a work of much interest, both to the inhabitants and visitors of

Clifton. The district to be examined will comprise a circumference of five miles, and will also be illustrated with a map, and geological remarks. It is not to be published before May next.

Drying Succulent Plants.

The President read the following valuable observations, from Mr. J. T. Syme, on this subject, dated June 28, 1852:—

It is now rather late to reply to Mr. Bladon's query as to the best way of drying succulent plants; but this season I have tried a new plan, which I find has several advantages over those generally followed. Instead of destroying the vitality of the specimens by heat, I tried the effect of *poison*, and used for this a solution of corrosive sublimate in wood naphtha, applied to the leaves by a large brush. I found it answer the purpose, and preserve the colour as well as the application of boiling water, except in the case of *Ophrys apifera* and *O. muscifera*, which turned quite black; but *Orchis fusca*, *Aceras anthropophora*, *Cephalanthera grandiflora*, *Habenaria bifolia*, *Leucojum æstivum*, *Centranthus ruber*, *Beta maritima*, and various succulent fruits—*e. g.*, *Daphne Laureola*—poisoned, look as well as specimens immersed in boiling water at the same time, and treated in the same way afterwards. The new method has the following advantages over the old:—

1st. It is much more easily applied to the parts that require it. It is easy to touch *any part* of a specimen that is not drying rapidly enough after it has been under pressure for some time. This is important, for both methods destroy the colour of the flowers if applied to them; but in leaving out the flowers, on the boiling-water plan, the upper part of the stem and germens are not killed, and often spoil the appearance of the specimen.

2nd. There is no difficulty with plants tried for the first time, as in the ordinary way, for each plant requires a certain temperature and time of immersion. If the heat be too great the leaves are blistered; if too little, or the time not long enough, the plant is not killed.

3rd. The plant is much more easily laid out when fresh, and then washed over with the solution. It requires a good deal of trouble to *properly lay out the leaves* of a boiled specimen, as they become so flaccid.

4th. The specimen is not saturated with moisture, and so is much sooner dried after the new than the old treatment.

5th. The plant is secure from the attacks of insects, as far as corrosive sublimate can make it.

The disadvantage of the new method is, that it takes more time if a large number of specimens have to be treated. The expense is so trifling that it need hardly be taken into account. I use the same solution as for poisoning the plants in my herbarium, *viz.*, 150 grains of corrosive sublimate dissolved in 24 ounces of wood naphtha.

Orchis hircina.

The President announced that four flowering plants of *Orchis hircina* had been found during the present year at the old Kentish station, but that he himself, having been obligingly conducted to the spot, by a gentleman who found it last year, could not discover a single plant. This was on the 7th of July, and probably too late to find any.

Eleocharis Watsoni.

The President wished to call particular attention to the addition of a new species to the list of our flowering plants, under the name of *Eleocharis Watsoni*, the characters of which were given at p. 625, since the publication of which report Mr. Babington had published the following summary of the differences between the allied species :—

1. The lowest glume is larger than the others, and surrounds the base of the spike in *E. uniglumis*, *E. Watsoni*, and *E. multicaulis*; but this is not the case, neither is it larger than the others, in *E. palustris*.

2. The stigmas are two in all except *E. multicaulis*, which possesses three. They have not been seen in *E. Watsoni*; but the lenticular nut renders it nearly certain that they are two in number.

3. The nut is more or less compressed, but variable in shape in all except *E. multicaulis*, in which it is acutely triangular and top-shaped. In *E. palustris* it is roundish, with or without a slight narrowing or stalk-like point at the base; in *E. uniglumis* it is pear-shaped; in *E. Watsoni* it is oblong, but a little narrowed at the base; in all of them it is smooth, with the exception of *E. Watsoni*, where its surface is closely punctate-striate throughout.

4. The nut is shorter than the hypogynous bristles in *E. palustris* and *E. uniglumis*, equals them in *E. multicaulis*, and exceeds them in *E. Watsoni*.

5. The sheath surrounding the base of the stem is transversely truncate, but having a very obtuse point on one side in all except *E. multicaulis*, where the point is acute.

From these differences Mr. Babington considered that the species was a distinct one, since it could not be confounded with either of the other European species, *E. ovata* and *E. atropurpurea*, which constitute Esenbeck's genus *Eleogenus*, and in which the glumes are all equally large, and more densely imbricated than in the typical group of species.

The President concluded by observing that he considered it very undesirable to found a species on such scanty materials: this as a general rule. He was not sufficiently master of the subject under discussion to pronounce any opinion as to the value of the characters pointed out.

Variety of Polystichum aculeatum.

The President exhibited lithographed sketches, kindly sent him by Mr. Kinahan, of the remarkable state of *Polystichum aculeatum* noticed by that gentleman, and recorded in the last number of the 'Phytologist' (Phytol. iv. 632).

Pseudathyrium alpestre.

The President read the following interesting note, from Mr. Westcombe, of Worcester, dated Clova, July 23, 1852, and observed that the plant was correctly named as *P. alpestre*:—

Herewith I forward a sample of a certain fern, common in this district, and which I consider is the *Polypodium alpestre*. I found it in Canlochen, and also in Glen Prosen and Glen Phee; and it is commoner than *Athyrium Filix-fœmina*, and varies much in size, from four inches to three feet in length. When large it has quite the appearance of *Athyrium Filix-fœmina*, and when small and in fructification looks more like a *Cystopteris*. Yesterday I had also the pleasure of seeing *Woodsia Ilvensis* for the first time. *Polystichum Lonchitis* is very abundant and fine, and I only regret that I cannot carry off more spoil.

Botanical News.

The President read the following articles, contributed by a correspondent:—

Italy.

The direction of the Botanic Garden in Rome has been entrusted to Dr. Sanguinetti.—*E. Otto's Gart. Zeit.*

The King of Saxony.

The King of Saxony, who is passionately fond of botany, is gone to Dalmatia to collect plants. Some years ago his herbarium, containing his Tyrolese acquisitions, was forwarded to Vienna, with instructions to send it on to Dresden. On its arrival, the sapient official at the Custom-house probed the several packages with an iron rod which is generally used for examining sacks of wool. Though nothing contraband was found, the specimens were spoiled, and no little noise was made about them.—*The Times*.

Meeting of German Naturalists.

The Twenty-ninth Meeting of German Naturalists and Physicians will take place on the 18th of September, at Wiesbaden. The convenience of the situation of Wiesbaden, and the facility of reaching it, are well known; the surrounding country is full of interest, geological, mineralogical, botanical, &c.; and all those who will honour the meeting with their presence will be sure to meet a hearty welcome from the Presidents and Secretaries and the assembled German naturalists.

“ INVITATION

to the Twenty-ninth Meeting of German Naturalists and Physicians:—

“ The Association of German Naturalists and Physicians have chosen Wiesbaden for the place of meeting this year, and have appointed the undersigned to be the managers. Our town is easily reached by railroad and by steam-boats, and its handsome and roomy accommodation, its treasures of art and nature, its mineral sources, and picturesque neighbourhood offer a most favourable and attractive locality for the meeting. We therefore earnestly invite our fellow-labourers and all friends of natural science to the meeting, and entertain the confident hope that the attendance will be most numerous. We and our fellow-citizens will do everything in our power to secure the scientific as well as social objects of the meeting. The meeting will last from the 18th to the 25th of September. The reception-office is at the Taurus Hotel, opposite the railroad-station, and will be open from the 15th of September, from 7 to 1 in the morning, and from 4 to 8 in the afternoon.

“ (Signed) Prof. Dr. FRESENIUS.

“ Dr. BRAUN.”

“ Wiesbaden, June, 1852.”

The following extracts from the Programme will complete the above information :—

“ Foreign ‘ Savants ’ are admitted as Associates at the meetings, and their participation in them is highly desired.

“ The Association consists of Members and Associates (*Theilnehmern*). The right of voting is limited to writers on natural sciences and medicine.

“ All Members and Associates must announce themselves at the Reception Office, to inscribe their names, and to receive their card of admission, the cost of which is two dollars pr. c., or six shillings. A Lodging Committee will be found at the Reception Office, to give the necessary information to strangers.

“ The General Meetings will take place on the 18th, 21st, and 24th of September, in the great room of the Kurhaus, from 9 a.m., to 12½ p.m. The card of admittance must be shown.

“ At the General Meetings, the right of delivering addresses is limited to the members who have the right of voting.

“ The meeting will, according to practice, form seven sections :—

“ 1. Physics, Mathematics, and Astronomy.

“ 2. Chemistry and Pharmacy.

“ 3. Mineralogy, Geology, and Geography.

“ 4. Botany, Agriculture, &c.

“ 5. Zoology, Anatomy, and Physiology.

“ 6. Medicine, Surgery, and Midwifery.

“ 7. Anthropology and Psychiatry.

“ The sections will meet on the 20th, 22nd, and 23rd of September, from 8 a.m. to 1 p.m., with a short pause at 10.

“ All persons wishing to deliver addresses, either in the General or in the Sectional Meetings, are requested to give up their papers, either *in extenso* or in abstract, to the Secretaries during the meeting. The MSS. will be returned to the authors, if requested, after the printing.

“ Mr. W. Kreidel, bookseller, has promised to open an office for information, from the 14th to the 24th of September, where visitors can obtain information respecting all sights, fêtes, &c. Office of the bookseller, Langgasse, No. 25.

“ Members wishing to read papers in the sections are requested to give them in to the Presidents of Sections the day before, up to 2 o'clock p.m.

“ A reading-room and writing-room will be opened for the convenience of strangers.

“ The daily report will be distributed gratis every morning to the

Members and Associates at the entrance of their respective places of meeting. It will contain a list of newly-arrived strangers, notice of the papers to be read, and fêtes to be held during the day.

“Three great dinners will take place in the large room of the Kurhaus, price one gulden, on the days of the General Meetings.

“The casino will be open to Members and Associates of the meeting.”—*Literary Gazette*.

Australia.

We learn from Hooker's ‘Journal of Botany,’ that Mr. James Drummond has returned from a journey of eighteen months' duration, which led to the discovery of several highly-interesting genera, and enabled him to amass a great collection of botanical specimens. “I could have procured many more plants,” he writes; “but the natives were so troublesome that I could only make excursions armed with a double-barrelled gun, and in company with mounted police. Both myself and my son John had several narrow escapes. At one time there were 200 natives invited to the feast they intended to make of our bodies after they should have killed us; providentially they did not succeed in their murderous designs.”

Cape of Good Hope.

That enterprising naturalist, Mr. Charles Zeyher, was making preparations for another journey in the interior of Southern Africa, a country he has now been exploring for more than a quarter of a century.

The Feilding Herbarium.

The University of Oxford has suddenly become possessed of one of the finest systematically arranged herbaria in the world. The late Henry Barron Feilding, Esq., of Hodday Lodge, Lancashire, and more recently of Preston, has for many years devoted his energies and income to the formation of a private herbarium. He originally became the possessor of the Prescott collection, then one of the most extensive in Russia, for which the British Museum and some other public institutions were said to be in treaty, but which Mr. Feilding secured by the prompt laying down of a sum which we have heard variously stated at from £1000 to £4000. This formed the foundation of his herbarium; it contained a nearly complete and accurately-named flora of the Russian dominions in Europe and Asia, besides many

miscellaneous specimens. At Mr. Lambert's death, Mr. Feilding purchased the collection of Ruiz and Pavon, one of the most extensive ever formed in the Andes of Peru, and the authority for the plants described in that magnificent work, the 'Flora Peruviana,' published in the last century, under the auspices of the Spanish government. For the last twenty years Mr. Feilding has been adding to his museum by an almost indiscriminate purchase of all the books and plants that have been offered for sale, either in England or on the continent. He bought from all the collectors sent out under the patronage of individuals, securing choice sets of their harvests; and he was a constant subscriber to all the foreign collecting societies. His collection was mainly kept in order through his own untiring zeal and devotion to its care; and at one time he obtained for it the scientific superintendence of the late Dr. Gardner, of Ceylon. It was during this period that he published, conjointly with Dr. Gardner, his only work, 'Sertum Plantarum,' comprising figures of new and rare plants contained in the Feilding herbarium. The plates were lithographed outlines, on the model of Hooker's 'Icones Plantarum,' and were drawn and lithographed by Mrs. Feilding, a lady of great accomplishments, the enthusiastic admirer of her husband's pursuits, and his unwearied assistant.

Mr. Feilding died suddenly towards the close of last year, and left his widow sole legatee, with the expressed wish that his herbarium and library should be offered to his *Alma Mater*, Oxford, under certain most liberal conditions, relating to its care, its accessibility at all times to all botanists properly recommended, its scientific superintendence and increase. For the purpose of carrying out these views, Mrs. Feilding chose as advisers and temporary trustees, Professor Daubeny, Sir W. J. Hooker, G. Bentham, Esq., and Dr. Alexander. Dr. Daubeny responded to the call in the most liberal spirit, proposed wise and safe regulations under which it should be offered to the University, and backed them by his personal exertions, by the offer of devoting a large share of his own emolument as Professor of Botany to the maintenance of the herbarium, and by guaranteeing cordial co-operation, apartments, and the use of his own library, &c., to whoever should be appointed to the Curatorship. The trustees had a prolonged conference with the Oxford authorities, the result of which was that the herbarium was gladly accepted, £1000 voted for building in the Botanic Garden a museum which should contain both that, the Sherardian, Dillenian, and other herbaria of historical as well as

botanical value, and the interest of £2000 devoted to its maintenance, &c., together with other minor advantages.

Under such auspices we cannot but anticipate a great impulse being given by Oxford to the study of botany ; the more as the time is come when it should be so. In Scotland the science has been greatly encouraged by botanical professors, both holding University and Regius salaries, who have faithfully devoted themselves to their pupils, and many of them to original research in the science which they teach. In the two great English Universities little or nothing has been done until within the last year, when Oxford has responded so liberally to the appeal of the trustees of the Feilding herbarium, and the new tripos has filled the botanical lecture-room at Cambridge. Our professors at University and King's College, London, give a vast deal more time to their students than their positions demand,—zeal for the cause of science, and not emolument, is their stimulus. Virtually, then, botany is supported in England by private liberality. The great herbaria and libraries of systematic botanists, *viz.*, those of Sir W. Hooker, Mr. Brown, Mr. Bentham, Dr. Lindley, and Dr. Alexander (we give them in the order, we believe, of their extent and value) are all privately procured and supported ; the microscopes, books, and apparatus of the physiologists are all private too. The botanist from abroad or the student at home must, to visit anything worth studying in England, obtain introductions to their possessors ; consequently systematic and structural botany make little progress in this country compared with the means at our disposal, whilst physiological is nearly confined to following up the observations of Continental professors, and the microscope is a mere toy in the hands of nine-tenths of its votaries. Great discoveries are seldom made by those who are acquainted with one branch only of the science they cultivate, and all our great physiologists have been as profound systematists. This essential preliminary knowledge is only to be obtained by a lifetime of travel and study, or by such extensive botanical gardens as no government could afford to maintain, or by herbaria such as only private individuals have hitherto possessed, but which our Universities should maintain as absolutely essential adjuncts to the cultivation of any branch of botanical science.—*Literary Gazette*.

Two Hundredth Anniversary of the Imperial Academy.

Simultaneously with the meetings of the German Association for the Advancement of Science, the Imperial Academy Naturæ Curio-

sorum, the oldest Natural-History Society in the world, has resolved to celebrate its 200th anniversary. The following is the official invitation :—

“ Breslau, July 24, 1852.

“ We have the honour of informing the members and friends of the Imperial Academy Naturæ Curiosorum in Great Britain, that the celebration of the 200th anniversary of our Society, which was postponed on account of the cold season (the 1st of January being the real birthday), will take place at Wiesbaden, on the 18th of September, 1852, simultaneously with the meetings of the German Association for the Advancement of Science, and it is to be hoped that the attendance will be most numerous on that important occasion, when every exertion will be made to render the stay of the members and visitors as agreeable as possible.”—*The Presidium*.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, July 8, 1852.—Dr. Seller, President, in the chair.

The following donations were announced to the Society's library, viz. :—‘ Proceedings of the Berwickshire Naturalists' Club,’ from the Club ; ‘ The Flower Garden Companion ’ for June and July, from Mr. Moore, the conductor ; and ‘ Proceedings of the Society for the Encouragement of Horticulture and Agriculture, and the Arts connected with them in Jamaica,’ from Dr. Gilbert M'Nab : also, to the Society's herbarium, a parcel of Australian plants, from William Collyer, Esq., of Greenhills, near Melbourne.

Variety of Rhododendron anthopogon.

Professor Balfour exhibited specimens, in flower, of a whitish Rhododendron, sent by the Earl of Home. It seems to be allied to *R. anthopogon*, and may perhaps be a variety of that species. In a note from the Earl of Home it was stated that the seeds had been received from the hills of Bokhara. His brother, Major Bell, got this from a brother officer, who made a tour to that country, and sent it home between the years 1837 and 1842. In forwarding the plant Mr. George Smith, his Lordship's gardener, observed :—“ I send you a Rhododendron which Lord Home thinks may turn out new to this country. Hitherto I have kept it in the greenhouse all the winter, and out of

doors during summer. It has never shown signs of flowering before this summer. It has this peculiarity,—that the flower-buds expand immediately after being formed. The seeds were gathered by one of the first British officers that travelled in the mountains near Cabul. He was no botanist, but said the flowers attracted his attention, being sweet-scented and of a yellow colour. I think it is about ten or twelve years since I got the seeds."

Professor Balfour exhibited various donations to the Museum of Economic Botany at the Botanic Garden. Among them the following are the most interesting :—

Rye.

From Mr. James Fulton, Glasgow :—Large specimens of rye, the produce of what has been termed a "stolen" crop. It was produced during the period intervening between the removal of the grain and putting in of the succeeding green crop. It was sown on the 22nd of September, 1851, and cut on the 11th of June, 1852, when it measured six feet six inches in length, and weighed in its green state forty tons per acre, the soil being of an inferior description.

Attalea compta ?

From Dr. M'Nab, Kingston, Jamaica :—Two spikes of fruit, three feet long, with five sections of the stem, each four feet in circumference, of a species of *Attalea* (probably *Attalea compta*), from the Ferry Garden, St. Catherines, Jamaica. Regarding this tree Dr. M'Nab says :—"I send two bunches of the fruit, and several sections of the stem, of a magnificent palm, unknown to me, introduced from Africa. It grew in the garden in front of the Ferry here. The one cut down was seventy feet in height. Its history, as far as I have been able to ascertain, is, that it was brought to this country by the celebrated Captain Bligh; and three were planted by himself in the garden at the Ferry, the other two in the Old Botanic Garden at St. Andrews. All, with the exception of the one cut down for the museum, are still in existence, and all handsome trees, some 100 feet high. I have got a dried spathe of it ten feet long, which I also intend sending to the museum." In regard to the *Attalea*, it was observed, in a note from Mr. Smith, of Kew :—"The palm of which you sent a fruit has been long known to me. I have heard of the two trees in Jamaica, and have plants of them growing. You are quite

right in judging it to be an *Attalea*; but it is not from Africa, but no doubt from some part of the Brazil coast, most likely from the Amazon, where it abounds. There are a number of species described, more than I think really exist: they are so much alike that they are very difficult to make out. I believe the present one is *Attalea compta* of Martius. They are all very slow growers. They make good roots and leaves, but take years before they form a trunk to begin to ascend."

Sebesten Plum (*Cordia Sebestana*).

The wood of this tree is said to give out a delicious perfume while burning; and a red dye is also prepared from its leaves.

Fruit of the Ochro (*Abelmoschus esculentus*).

The young pods are gathered green, and used in soups, also pickled like capers. They are full of nutritive mucilage, and when cooked with butter make a rich dish.

Vegetable Rope.

Specimen of peculiar root-like twigs, found hanging at the extremities of the long rope-like stems of the *Cassia trifoliata*, at Spanish Town, Jamaica. This vegetable rope is frequently from twenty to thirty feet in length.

Dried Fruit of the Mammee Tree (*Mammea americana*).

The fruit is eaten raw, cut in slices, with wine and sugar. The seeds are bitter and resinous.

Jamaica Pickles.

Mr. M'Nab exhibited specimens of Jamaica pickles, made from the leaves and young flower-spikes of the cocoa-nut, from the leaves of the macaw-tree (*Cocos fusiformis*) and cabbage-palm (*Euterpe montana*), and from the fruit of the water-melon (*Cucurbita Citrullus*), and prickly cucumber (*Cucumis anguria*).

The following papers were read:—

Fluorine in the Stems of Gramineæ, &c.

'On the Presence of Fluorine in the Stems of Gramineæ, Equisetaceæ, and other Plants, with some Observations on the Sources

from which Vegetables derive this Element ; by George Wilson, M.D.' The author commenced by stating that the earliest observer of the presence of fluorine in plants was Will, of Giessen, who found traces of it in barley, the straw and grain of which were analyzed together. The author reported to the Botanical Society, some four years ago, the results of his earlier researches into the distribution of this element throughout the vegetable kingdom, which were not very numerous or very encouraging. One reason of this was the small extent to which fluorine occurs in plants ; another, and practically as serious a reason, was the difficulty of separating and recognizing fluorine when accompanied by silica. The presence of this body in a plant, besides greatly complicating the investigation, rendered the employment of platina vessels essential, and thus limited the amount of material which could be subjected to examination, besides making it difficult or impossible to observe the progress of an analysis.

The author then stated that in the course of some recent investigations into the presence of fluorine in siliceous rocks, he had succeeded in devising a process which was also applicable to plants, and could be carried on in the ordinary glass vessels of the laboratory. The process in the case of plants was as follows :—The plant under examination was burned to ashes as completely as possible. The ashes were then mixed, in the cold, with oil of vitriol, so as to secure the decomposition of the salts of volatile acids present. The mixture was then transferred to a retort, or flask, provided with a bent tube dipping into water, and the liquid raised to the boiling point, when fluorine, if present, was evolved in combination with the silicon of the silica, as the gaseous fluoride of silicon, which dissolved in the water, with separation of some gelatinous silica. The resulting solution was neutralized with ammonia, and evaporated to complete dryness, when the whole of the silicon passed into the condition of insoluble silica, and water dissolved the fluoride of ammonium. The solution of this fluoride could then be dried up and moistened with sulphuric acid, when hydrofluoric acid was evolved, which might be made permanently to record its presence, by causing it to etch glass in the usual way. The author has in the meanwhile applied this process almost solely to the stems and trunks of plants, especially to those containing silica, reserving for subsequent investigation their other organs, especially their seeds and fruits. The following were the results obtained :—

Table of Plants examined for Fluorine. The numbers represent grains of ashes, except in the case of Tabasheer and Wood Opal. The blanks imply that the weight was not known.

Ash in Grains.	Name of Plant.	
200	Horsetail (<i>Equisetum limosum</i>)	Distinct etching.
	Common bamboo (<i>Bambusa arundinacea</i>)	do.
	Charcoal (derived chiefly from oak, and to a smaller extent from birch)	do.
	Coal	do.
	Barley straw	do.
	Hay (rye-grass)	do.
35	<i>Equisetum variegatum</i>	Faint etching.
19	„ <i>hyemale</i>	do.
295	„ <i>palustre</i>	do.
	Tussac grass (<i>Dactylis cæpitosa</i>)	do.
99	<i>Elymus arenarius</i>	do.
495	Sugar-cane (<i>Saccharum officinarum</i>)	do.
1040	African teak	do.
	<i>Smilax latifolia</i>	No etching.
	Common rosemary (<i>Rosmarinus officinalis</i>)	do.
235	Nepaul bamboo (<i>Bambusa Nepalensis</i>)	do.
	Common fern (<i>Polypodium vulgare</i>)	do.
537	Tree-fern	do.
24	<i>Phalaris arundinacea</i>	do.
240	Malacca cane	do.
50	Cocoa-nut shell	do.
127	Indian teak (<i>Tectona grandis</i>)	do.
80	Tabasheer	do.
1680	Wood opal	do.

On this table the author remarked, that the siliceous stems which he had found to abound most in fluorine were exactly those which contained most silica. In particular, deep etchings were procured from the Equisetaceæ (horse-tails), and from the Gramineæ (grasses), especially the common bamboo. The last was known to contain silica in such abundance that it collected within the joints in white masses, nearly pure, and had long, under the name of tabasheer, been an object of interest to natural philosophers. The horse-tails were scarcely less remarkable for the amount of silica contained in their stems, which had led to the employment of one of them (Dutch rush, *Equisetum hyemale*) in polishing wood and metals. The African teak, which, like the bamboo, is known sometimes to secrete silica, was also found to contain fluorine, though much less largely than the plants named; whilst the strongly siliceous stems of barley and rye-

grass also yielded the element in marked quantity. The sugar-cane, however, gave less striking results than might have been expected; and the same remark applied to the Malacca cane. Two specimens of silicified wood and one of tabasheer gave no evidence of the presence of fluorine. So far, however, as the plants named in the preceding table are concerned the author does not wish it to be inferred, from the negative results which are detailed, that the plants in question are totally devoid of fluorine. With larger quantities of their ashes positive results would in all probability be obtained.

The author's general conclusions were as follows:—1st. That fluorine occurs in a large number of plants. 2nd. That it occurs in marked quantity in the siliceous stems of the Gramineæ and Equisetaceæ. 3rd. That the quantity present is in all cases very small; for, although exact quantitative results were not obtained, it is well known that a fraction of a grain of fluoride will yield, with oil of vitriol, a quantity of hydrofluoric acid sufficient to etch glass deeply; so that the proportion of fluorine present, even in the plant-ashes which contain it most abundantly, does not probably amount to more than a fraction per cent. of their weight. The proportion of fluorine appears to be variable, for different specimens of the same plant did not yield concordant results.

In this, however, there is nothing anomalous, for some bamboos yield tabasheer largely; whilst others are found to contain none. It seems not unlikely that soluble fluorides ascending the siliceous stem of a plant, on their way to the seeds or fruits in which they finally accumulate, may be arrested by the silica, and converted into insoluble fluosilicates (fluorides of silicon and of a metal); and a bamboo, for example, secreting tabasheer, may effect this change where one less rich in silica cannot determine it. The slow or quick drying of a stem may also affect the fixation of fluorides in the stems or trunks of plants.

The sources of the fluorine found in plants may be regarded as pre-eminently two: (1) simple fluorides, such as that of calcium, which are soluble in water, and through this medium are carried into the tissues of plants; and (2) compounds of fluorides with other salts, of which the most important is probably the combination of phosphate of lime with fluoride of calcium. This occurs in the mineral kingdom in apatite and phosphorite, and in the animal kingdom in bones, shells, and corals, as well as in blood, milk, and other fluids.

A recent discovery of the author's, communicated to the Royal Society of Edinburgh, has shown that fluorides are much more widely

distributed that is generally imagined, and that the trap-rocks near Edinburgh, and in the neighbourhood of the Clyde, as well as the granites of Aberdeenshire, and the ashes of coal contain fluorides; so that the soils resulting from the disintegration of those rocks cannot fail to possess fluorides also. All plants, accordingly, may be expected to exhibit evidence of their presence, in the following portions of their tissues or fluids:—

1. In the ascending sap, simple fluorides.
2. In the descending sap, in association with the albuminous vegetable principles, and in the seeds or fruits, in a similar state of association, fluorides along with phosphates.
3. In the stems, especially when siliceous and hardened, fluorides in combination with silica. The investigation is still in progress.

Iodine in various Plants.

‘On the Presence of Iodine in various Plants, with some Remarks on its General Distribution;’ by Mr. Stevenson Macadam, Teacher of Chemistry at the Philosophical Institution. The present paper owes its origin to some observations lately made by M. Chatin, of Paris, and communicated by him to the French Academy of Sciences.

Chatin is of opinion that in the atmosphere, in rain water and in soils, there is an appreciable amount of iodine; that the quantity of this element present in one district differs from that in another; and that the relative amount of iodine in any one locality determines to a great extent the presence or absence of certain diseases. For instance, in the district of a country which he classifies under the general title of the “Paris zone,” the quantity of iodine present in the atmosphere, in the rain water and in the soil, is comparatively great; and to this he ascribes the absence of goitre and cretinism: whereas in the zone corresponding to that of the “alpine valleys” the amount of iodine has diminished to one-tenth of that found in the “Paris zone;” and to this scarcity of the element he attributes the prevalence of goitre and cretinism, which in that zone are endemic. Considering that the subject was one of great importance, more especially if the conclusions arrived at by Chatin (in reference to the functions fulfilled by iodine in preventing the occurrence of the diseases referred to) could be legitimately deduced from the experiments which he performed, the author has this summer undertaken a series of analyses in reference to the general distribution of iodine. Mr. Macadam’s researches have

as yet been mostly directed to the atmosphere and to rain-water ; and he considered that a notice of the results obtained might be interesting to the Society, alike from the intimate connexion which exists between the plant and the atmosphere, and from the fact that he has been led to look for, and to detect, the presence of iodine in a department of the vegetable kingdom in which it has not formerly been observed.

Chatin has not published a detailed account of the processes adopted by him ; but, from the manner in which he speaks of the good effects produced by the addition of potash to substances under examination, which, to use his own words, “arrested the complete decomposition of the iodine compounds, whilst the waters were evaporating,” and by the addition of carbonate of potash and carbonate of soda, which “rendered the iodine present in soils much more easily extracted,” the author was led to believe that the fixed alkalies had been largely employed by him. Accordingly, in the first experiments the alkalies were used in their caustic condition, for the purpose of fixing any free iodine, and retaining any compound of iodine, which might be encountered.

Mr. Macadam commenced with an examination of the atmosphere. By the arrangement he employed, the air was made to traverse—1st, a tube containing slips of paper which had been previously dipped in a solution of starch ; and 2ndly, a double-necked gas-bottle, containing about three ounces of a dilute solution of caustic soda. A continuous stream of air was drawn through the arrangement for some hours. This experiment was conducted in the morning ; and in the afternoon a stream of air was for several hours drawn through the same arrangement, caustic potash being substituted for the caustic soda. The starch-papers did not exhibit the slightest colouration, even when moistened with distilled water. The solutions of potash and soda, however, on being treated with starch and nitric acid, at once exhibited the rose colour characteristic of the presence of iodine in small quantity. So far the experiments seemed to lead to the desired conclusion ; but when portions of the original alkaline solutions, which had not been subjected to a current of air, were carefully tested, it was found that iodine was present in them, in quantity, to all appearance, as great as it was in those portions which had been used in the experiments.

Wishing to trace back the iodine to its source, samples of the carbonate of potassa, carbonate of soda, and lime-shell which had been employed in the preparation of the caustic solutions, were analyzed,

and in all three iodine was present in perceptible quantity. Desirous of making certain that the agents used in the investigations were as pure as other commercial substances of the same kind, various specimens were procured, from different sources; and in every sample which was subjected to examination the presence of iodine was detected. So far, then, as the determination of iodine in the atmosphere is concerned, the experiments were of no value. The alkalies through which the air had been drawn undoubtedly contained iodine originally; and therefore no certain conclusion could be drawn as to the probability of their being more highly iodized by contact with the atmosphere. To the presence of iodine in *potashes*, or, to use words more strictly botanical, in the *ashes of forest timber*, further reference will be made in a subsequent part of this paper.

In the next experiment the alkalies were dispensed with, the air being drawn through—

1st. A tube with slips of starched paper, kept somewhat damp.

2ndly. A gas-bottle immersed in a freezing mixture.

3rdly. A gas-bottle containing a solution of nitrate of silver.

A continuous current was kept up for fully five hours, commencing at mid-day. At the conclusion of this experiment the papers were not altered in the slightest degree; the gas-bottle (2) contained about a quarter of an ounce of liquid, and the nitrate of silver (3) had not been perceptibly changed. The condensed liquid was neutral to test-papers. A drop of starch was added to it, and subsequently nitrate of potassa and hydrochloric acid, which together form a most delicate means of detecting iodine. The result was negative. The nitrate of silver solution was cautiously evaporated to half an ounce, sulphuretted hydrogen added to precipitate the silver, and liberate, as hydriodic acid, any iodine which might be present; the liquid raised in temperature, carefully avoiding ebullition, and filtered. The filtrate, on the addition of starch, nitrate of potassa, and hydrochloric acid, did not exhibit the slightest trace of iodine. Mr. Macadam therefore concluded, that in the large volume of air which he had drawn through the arrangement there had not been an appreciable amount of iodine.

The experiments as yet referred to were made, at different heights, on Arthur's Seat; and their negative results led to arrangements being made for a trial on a scale much more extensive. Through the kindness of the proprietor of Kinneil Iron-works, the author was enabled to proceed to Borrowstowness, and attach his apparatus to the receiver from which the air, under great pressure, is forced into the blast

furnaces. By means of a stop-cock fixed in the receiver, and a long, flexible tube, the air was conducted to the following arrangement :—

1. A wide tube, containing slips of paper dipped in starch.
2. A condensing-worm, surrounded by a freezing mixture and attached to a receiver.
3. A tall jar, containing chips of pumice-stone and a few iron-filings, with sufficient water to cover them.
4. A similar jar, with pumice-stone, scrapings of clean lead, and a solution of acetate of lead.
5. A condensing-worm, immersed in a freezing mixture and attached to a receiver.

The air, under a pressure of three lbs. on the square inch, was allowed to traverse the arrangement for fully four hours, when the apparatus was taken asunder; and, the contents of the vessels being placed in stoppered bottles, the whole was brought to Edinburgh for examination. The slips of paper (1) were not sensibly altered in tint, and did not betray the slightest indications of even a rose colour when moistened with distilled water. The condensers (2 and 5) contained each a very small quantity of liquid, which on being tested did not show a trace of iodine. The small quantity of liquid in the condensers may be accounted for by the comparatively high temperature possessed by the air rushing through so quickly as it did. The contents of the jar (3) were thrown on a filter, and washed with cold water. To the filtrate was added half an ounce of a solution of carbonate of potassa; and the whole evaporated to a quarter of an ounce. No iodine was present. The carbonate of potassa used in this trial was prepared by calcining cream of tartar, and was so far free from iodine that none could be detected in two ounces of the solution, of which half an ounce was employed. There was therefore no likelihood of iodine being added in the alkali used, even though the analysis of the contents of the jar had shown its presence. The jar (4) with the lead solution was treated in the same manner as described in a former part of this paper, when referring to the employment of silver; and the result was also negative. Notwithstanding the large scale on which this experiment was conducted, a volume of air of not less than 4000 cubic feet having been forced through the arrangement, Mr. Macadam has been unable to verify the results of Chatin; yet he feels disinclined to pronounce those results unwarranted, and has therefore resolved to make another trial, on a still larger scale. It is proposed to fit up an apparatus of a stronger and more durable

nature, and to allow a volume of air of not less than 100,000 cubic feet to pass through.

While the experiments on the atmosphere were proceeding, Mr. Macadam was also examining large quantities of the rain-water which fell in Edinburgh for the last two months. For this purpose he added to three gallons of the water some ounces of a solution of acetate of lead. On standing twenty-four hours, a precipitate had fallen to the bottom, from which the liquid was drawn off. The precipitate was treated as formerly described; and no iodine was detected. As the iodide of lead is slightly soluble in water, and as it might be present in the liquid which had been removed from the precipitate, the whole was evaporated to one ounce, and afterwards tested for iodine, but none was present. A second experiment was tried with a similar volume of rain-water, *viz.*, three gallons, substituting nitrate of silver for the acetate of lead. A precipitate was observed after standing for twenty-four hours; but neither it nor the liquid contained a trace of iodine. Another experiment, made with three gallons of rain-water which had been collected at Unst, in the Shetlands, and to which acetate of lead was added, gave the same negative results.

Mr. Macadam is well aware that, consequent on the evaporation of water from the surface of the ocean, portions of the salts contained in it are carried up and disseminated through the atmosphere, ready to be rained down upon inland places; and that in this way iodine, most probably as iodide of sodium, will be present in the air. Accordingly, at the first he was confident that he should succeed in verifying Chatin's observations in a district so near the sea as that around Edinburgh is, and more especially in the water obtained from Unst, which had fallen in the immediate vicinity of the ocean; but when we consider what a very small per centage of iodine is present in the water of the ocean, many gallons being required to give even a faint indication, equal to that exhibited by 1.500,000th of a grain of an alkaline iodide; and if, further, we suppose that when the water rises in vapour from the sea, it carries up the salts in the same proportions as they exist in sea-water; it is evident that it would be requisite to evaporate some hundred gallons of rain-water before even a minute trace of iodine could be obtained.

At a former part of this paper reference was made to the presence of iodine in the potashes of commerce. The samples first tested were those usually to be purchased in Edinburgh; but subsequently genuine and authenticated specimens of both crude and refined potashes were procured from Glasgow. It is to Canada and the United States

that we owe our supplies of these materials. As imported into this country they are contaminated with many foreign ingredients; and amongst the rest the author has detected iodine. The most ready means for separating and recognizing this substance, is to heat a considerable quantity of the salt with a minimum of water. On cooling the solution, the greater portion of the carbonate of potassa, as well as the impurities, falls to the bottom of the vessel; whilst the iodide of potassium remains dissolved in the water. When testing for the iodine in the potashes, this solution was evaporated to dryness, treated with alcohol, boiled, and filtered. The filtrate on being evaporated to dryness left a residue, which on re-solution in water acted distinctly with the starch test for iodine.

The presence of this element in potashes leads the author to believe that iodine will be found more generally distributed in the vegetable kingdom than it has formerly been supposed to be. The potashes from the States, and from Canada, are principally the dried lixivium of the ashes of forest-trees; but, whilst by much the greater portion is so, the parties in charge are not very scrupulous about what plants they employ; and occasionally everything which comes in the way, and which will burn, is added to the pile. It may therefore be objected to the statement that forest-trees contain iodine, that the iodine found in the ashes may be derived from the succulent herbs and shrubs, and not from the trees themselves; but this objection will be at once removed when it is stated, that in the lixivium of charcoal the author has obtained very distinct traces of iodine. Now the charcoal sold and used in this country is principally oak, with a little birch, elm, and ash.

The amount of iodine in forest-trees must be comparatively small. When experimenting with the potashes, one is apt to forget the small bulk into which a large quantity of timber falls when the organic matter is expelled, and the saline ingredients are alone left. So far as can be estimated from the present qualitative experiments, the relative quantity of iodine in forest-trees is much less than that in succulent plants growing in marshy places.

In conclusion, it was mentioned that the presence of iodine in some fresh-water plants was now generally recognized, and that the author is at present engaged in testing the various plants growing in the lochs in the neighbourhood of Edinburgh. The method employed in their analysis is to dry the plants, burn them cautiously (indeed, the *burning* should be rather termed *charring*); the ashes are reduced to fine powder, digested in water, and filtered; the clear liquid evaporated

and subsequently treated like the potashes. In every case the process used for the liberation of iodine is that suggested by Dr. Price, *viz.*, nitrite of potassa and hydrochloric acid; and in many cases where no indications of iodine could be obtained by the ordinary methods good results were procured with Dr. Price's process.

In the following plants, hitherto unknown to contain iodine, Mr. Macadam has detected that element:—*Myosotis palustris*, *Mentha sativa*, *Menyanthes trifoliata*, and *Equisetum limosum* (Duddingstone Loch), *Ranunculus aquatilis*, *Potamogeton densus*, and *Chara vulgaris* (Dunsappie Loch).

The author has also confirmed the presence of iodine in the following plants, in which it had been previously found by other observers; the specimens, however, are from different localities:—*Iris Pseud-acorus*, *Phragmites communis* (Duddingstone), and in the ashes of coal.

As having some connexion with the subject treated of, the author intimated that he had obtained distinct indications of the presence of bromine in the crude potashes. It is unfortunate that our tests for bromine are so much inferior in delicacy to those of iodine, that it is necessary to operate upon very large quantities before the tests are distinct. There is no doubt that, from its presence in trees, it will be found in greater abundance in the more succulent plants; but the few trials yet made have been unsuccessful in determining its presence in any but the crude Canadian and American potashes.

The experiments (excepting those pursued in the open air) were conducted in the laboratory of Dr. George Wilson, to whom the author feels deeply indebted for the kind manner in which he has afforded him every assistance in his power during the whole course of the investigation.

Localities of Rare Scotch Plants.

Professor Balfour noticed the following localities for rare Scotch plants observed by him during his trips this season, *viz.*:—

Nuphar lutea. Loch near Dunfermline.

Trollius Europæus. Hill of Knock, near Dunfermline.

Teesdalia nudicaulis. Braid Hills (George Morris).

Nasturtium palustre. Banks of Tweed, Gladswood, near Melrose.

Viola hirta. Gladswood, Melrose.

Malva moschata. Gladswood, Melrose.

Geranium nodosum. Banks of Tweed.

Euonymus Europæus. Gladswood.

Galium pusillum. Gladswood.

Galium Mollugo. Gladswood.

Anthemis arvensis. Near Dryburgh and Melrose.

Doronicum Pardalianches. Bemersyde, near do.

Vaccinium Oxycoccus. Hill of Knock, near Dunfermline.

Mentha viridis. Near Dryburgh and Melrose.

Plantago media. Near Melrose.

Listera cordata. Eildon Hills.

Neottia Nidus-avis. Dunglas.

Carex irrigua. Near the Hill of Knock, Dunfermline; collected by Messrs. Wakefield, Ross, and Sharp.

Carex pauciflora. Near the Hill of Knock.

Carex pendula. Dunglas.

Scirpus sylvaticus. Near Dryburgh.

Melilotus vulgaris. Waste ground at Canonmills.

Arundo Epigejos. Ballast-heaps, St. David's.

Allosorus crispus. Saline Hill, Fife; Eildon Hills, Melrose.

Equisetum Telmateia. Dunglas.

Poisonous Qualities of Homeria collina.

Dr. Balfour read the following letter, by Mr. Richard Fryer, to Dr. Pappe, of Cape Town, relative to a case of poisoning by the bulbs of *Homeria collina*, specimens of which were exhibited to the meeting:—

“On perusing your ‘*Flora Capensis Medica*’ the other day, the circumstance stated at p. 26, of the poisonous effects of the bulb of the ‘Cape tulip,’ brought to my recollection a dreadful accident which occurred in Hantam, in this district, many years ago; and, as I was called upon at the time, in a judicial way, to examine some of the bodies, and take evidence upon the causes of death, I can vouch for the accuracy of what I shall here relate. It appears that one of the shepherds of a farmer residing there brought home in the evening a bundle of bulbs, which the Dutch call ‘Mutjes;’ that towards dusk these were put under the ashes to roast; and when the other servants assembled in the kitchen they were taken out, and eaten amongst them; the party consisting of three Hottentots, two women, and one male slave. About half an hour after they had partaken of them they were all seized with dreadful nausea, followed shortly afterwards by severe vomiting, and a speedy prostration of strength. The farmer, being called, ascertained immediately, from some of the bulbs still unconsumed, that they had been eating of the *Homeria collina*, of the yellow sort, ‘Wilde Dagga.’ Sweet-oil, milk, and everything thought

good were immediately administered ; but before midnight the three Hottentots and one woman had died, in excruciating agonies. The male slave was got through, although for a year afterwards he looked like a skeleton ; and the surviving woman ascribed her safety to only having ate one bulb."

On Lastrea cristata and its Allies. By THOMAS MOORE, Esq.,
F.L.S.*

SOME time since, in writing of the *Lastrea uliginosa* of Newman, I stated an opinion that it was more nearly allied to the species known as *L. cristata* than to that known as *L. spinulosa*, though intermediate between them ; and, acting on this opinion, I ranged it as a variety of the former. Subsequently, and with apparent reference to the expression of this opinion, this so-called new fern has been publicly stated to have nothing to do with *L. cristata*, and that, if ranged as a variety at all, it must be under *L. spinulosa*. My opinion was not altered by this statement ; and, having since continued to watch the appearances presented by the three plants, above referred to, under cultivation, I have not subsequently found reason to adopt any materially different view. On the contrary, having cultivated them under circumstances exactly correspondent, the plants themselves, as it appears to me, clearly confirm the opinion I had expressed ; and they are now exhibited for the information of those members who may not have had other opportunities of noticing their peculiarities. On this point I leave the plants to speak for themselves.

I have stated that my opinion has undergone no material change. I should perhaps have said that the view I now adopt is not opposed to that formerly held ; for I must confess to a change of opinion having occurred, inasmuch as repeated observation of the growth of the plants has convinced me that all three ought to be considered as forms of one species, there being no clear and satisfactory marks by which to distinguish them. This opinion, which I have for some time formed, from observations on the growing plants, in a cultivated state, has just been unexpectedly corroborated on opening the third volume of Mr. Watson's valuable '*Cybele Britannica*,' where I find the same view, apparently founded on experience of the wild plants, expressed by

* Read before the Botanical Society of London.

Mr. Hort (whom, I may remark, in passing, the very cautious author of the *Cybele* mentions as a trustworthy authority). Thus endorsed, the question seems worthy the attention of British botanists.

My views, in brief, are these:—The spinulose *Lastreas*, as is well known, present an unbroken series of forms between those known as *cristata* and *fœnisecii*, scarcely separable, indeed not separable, except by mere technicalities. *Lastrea fœnisecii*, however, mixed up with the rest by some botanists, appears to me perfectly distinct, and is readily known by its truly deltoid outline, its concave pinnules, its lacerated lance-shaped scales, and perhaps even more readily when dried, by its powerful fragrance, like that of new hay. Then follows *L. dilatata*, of which there are many forms or varieties, several having been exalted into species, different, though scarcely separable, but all distinguishable by their entire, lance-shaped scales, and gland-fringed indusia. And then follow the ferns under consideration, united by their ovate, pallid scales, and their entire indusia, and not more than separable as varieties by the form and mode of division of their fronds. For this latter “group” (as no doubt it may be called in some quarters) it seems best to retain the name *cristata*, partly in order to avoid the confusion which has resulted from the interchange of the names *spinulosa* and *spinosa*, but chiefly because the plant known as *cristata*, though not the most common, is the most distinct form, and bears a Linnæan antiquity, having been most probably used by Linnæus himself in the very sense which it is now again proposed to adopt; for in truth Linnæus has been charged with “confounding” under one name the two extremes of the short series I now propose to unite under the name he employed.

THOMAS MOORE.

Chelsea, August, 1852.

Observations on Cœnanthe fluviatilis, Coleman.

By E. G. VARENNE, Esq.

IN the ‘British Flora,’ ed. 6, p. 168, there occurs the following remark, under the head of *Cœnanthe fluviatilis*, *Colem.*:—“It would appear too that the flowering stems are unlike those which bear the above described submersed leaves.” From this observation one is led to imagine that a doubt exists in the minds of the writers as to whether the submersed leaves and the flowering shoots grow from one

and the same stem, as if it were probable that the foliage of the barren and of the lower portion of the flowering stem of *Æ. fluviatilis* differed in character. Feeling that there was a certain discrepancy of opinion amongst botanists on the subject, I was led to make sundry examinations of the stems of *Æ. fluviatilis* during the last month, with a view of ascertaining the real meaning of the different conditions of the plant; and such conclusions as I have been led to I beg to lay before the readers of the 'Phytologist.'

The flowering shoot of *Ænanthe fluviatilis* has been so well described by the Rev. W. H. Coleman, that any reference to that part of the plant is needless. The portion to which, in the present observations, I feel most desirous of attracting attention is that from which the submersed leaves grow.

This portion is a creeping stem, varying in length from two or three inches to a foot, according to age, and in diameter from a quarter to half an inch and more. The barren or distal extremity is copiously supplied with roots, and the portion extending from the rooted extremity to the origin of the terminating leaves is furnished with nodes and internodes. In full-grown stems the length of the internodes varies from a quarter of an inch to an inch, being greatest about the middle of the stem. From the under part of the nodes, radicles pass down into the mud. About the commencement of July, and probably at other seasons, buds, destined to become young plants, sprout out from the sides of the nodes, taking a lateral direction, their leafy termination curving upwards in the water.

In a very short period, and whilst attached to the parent stem, these young plants, terminated by leaves having the character of the submersed leaves, exhibit the creeping character of the stem, with its nodes and internodes, and roots striking into the mud. As well as roots and leaves, these small plants are furnished occasionally with long, green, thread-like fibres, springing from the upper nodes, near the leafy buds. With these I was for some time puzzled, until I met with something that induced me to form the opinion that these green fibres might be the early condition of the flowering shoots.

I was led to the above conclusion by finding attached to a large, creeping stem, which was terminated by a flowering shoot, and which was furnished with young leafy stems at its nodes, two long, fragile fibres, eighteen inches in length. Springing from the three or four distant nodes of these long fibres, were the young leaves and incipient flower-stalks of a flowering shoot; so that it is pretty clear that the flowering shoots and submersed leaves are producible from the

same stem, but from buds differing in character. This may also account for the fact of Mr. Woods being unable to detect submersed leaves in the plants he examined at Wareham; (see Phytol. iii. 266). I have, however, succeeded in meeting with the submersed leaves in a small but characteristic condition, attached to young flowering shoots of *Ænanthe fluviatilis*. Indeed, the lowermost nodes of the flowering shoots are almost always bare of foliage, either from early destruction of the submersed leaves, or from the lower nodes of the shoot being abortive, the latter supposition being the more probable.

The barren or rooted end of the fully-developed plant is rotting or decaying in the month of July; and at the same time the seven or eight young plants, which are to take the place of their predecessor in the season to come, are to be seen attached to the various nodes of the stem. The fully-formed submersed leaves become brown early in the summer, and have a worn-out appearance, from being coated over with deposit. Probably this decay is occasioned by the vitality of the leaves being interfered with by the twisting and straining to which they are exposed, from the frequent disturbance of the current, and of the level of the waters, produced by floods in winter and spring, and by the occasional drawing off of the water in the summer, by the millers. However this may be, the submersed leaves soon decay after the flowering season, as, I believe, does the entire stem, of which they form the extremity, so soon as the brood of young plants which spring out of it is fit to maintain an independent existence.

Having for the last year or two collected specimens of *Ænanthe fluviatilis* for the Botanical Society of London, I made a point of selecting the smaller green autumnal submersed leaves, rather than the large, dirty-looking remains of those that had lived through the previous winter. Attached to the rooted extremities of these green autumnal specimens, was frequently what seemed like a hard lump of dirt, and which was very carefully washed off, for the sake of giving the specimens a neat appearance. Now, indeed, this lump would have a greater degree of interest connected with it, as being probably the remains of the node and internode of the parent stem from which the young plant originated.

Allowing the above observations the credit of being correct, it seems tolerably clear that the duration of *Ænanthe fluviatilis*, *Colem.*, is of a biennial rather than of a perennial character. The existence of *Ænanthe fluviatilis* would not be much prolonged in our rivers and the ditches connected with them, in the abundance it now is, if it were dependent for reproduction on fruit alone; for its flowering

shoots are carried away in the autumn, as Dr. Bromfield describes, as soon as they separate from the ground ; and even before that period the flowering tops of the plants, yet entangled amongst the masses of weeds and other things that float down the current, and are cut off before the seed can come to perfection. In order to counteract the destructive agency to which the seeds of the plant are exposed, a wonderfully increasing power is imparted to the stems of *Ænanthe fluviatilis*, by the viviparous mode of increasing by buds which they possess ; and thus, for some wise purpose, is *Ænanthe fluviatilis* almost the only evergreen plant of our rivers and ditches, affording shade and shelter to aquatic animals at all times and seasons.

I have but one observation more to make on the subject of *Ænanthe fluviatilis* ; and that will bear on the shape of the submersed leaves. Some readers of the 'Phytologist' may have been struck with what appears like a parsley-leaf, springing up in shallow river-ditches, above the *Enteromorpha intestinalis* and other fresh-water *Confervæ* which cover the surface of the water in July and August. A little pains taken to extract the parsley-like leaf, with its stem, from its parent mud, will show that this leaf is a transformed condition of the submersed leaves of *Ænanthe fluviatilis*, as leaves of the natural form and size of the submersed leaves are found growing from the same root with the parsley-like leaf. Indeed, the leaflets of the parsley-like leaves of *Ænanthe fluviatilis* consist merely of the base and termination of the long leaflets which grow in the current. This is an interesting fact, and tends to prove that the original idea of Dillenius contained the elements of truth, when he ascribed the lengthening out of the plant to the action of running water ; and it also furnishes matter for consideration as regards the specific identity of *Ænanthe fluviatilis* and *Æ. Phellandrium*.

E. G. VARENNE.

Kelvedon, August 17, 1852.

Botanical Notes of a Week in Ireland during the present Month
(August, 1852). By DANIEL OLIVER, JUN., Esq., F.B.S.E.

Filago minima, Fries. I took advantage of the interval between the time of the arrival of our train at Maryport and the departure of the steam-packet, to look about on the sand-hills southerly from the harbour. I picked several specimens of this *Filago* at a short distance from the town. It appears to be new to the Lake Province of

the 'Cybele.' *Polygonum Raii*, *Bab.*, and *Sinapis Monensis*, *R. Br.*, were also in the neighbourhood.

Naias flexilis, Rostk. I was fortunate enough to re-find this plant, growing in a lake near Roundstone, between the Clifden-coast road and the sea, at a distance of perhaps a mile or two from the village. Although I spent some time amongst the several lakes of the neighbourhood, the *Naias* was observed in but sparing quantity; and, from the fragile nature of the plant at the nodes, or "joinings," it is rather difficult to obtain perfect examples. I did not take an opportunity to search for it in the Lake country northwards from Urrisbeg Mountain, nor in the Ma'am and Ballinahinch districts, although many of the lakes, having sandy or gravelly beds, in Connemara are likely enough to afford it.

Eriocaulon septangulare. Near Roundstone this plant occurs from near the sea-level to an elevation which I should estimate about 300 feet, in a lakelet in Urrisbeg, the height of the Ordnance Survey station, nearly 1000 feet, on that mountain, serving as a guide.

Ulex Gallii, Planchon. This shrub grows near Roundstone. I did not observe any autumnal bloom when in Ireland until we were west from Oughterard; and, I think, some time ago, when journeying into Connemara from the north, none was observed until a few miles northerly from Clifden. I now incline to believe it probable that the Connemara *U. nanus* belongs to this species or variety. The true *U. nanus* of Forster I doubt if I have ever seen growing in a wild state. *U. Gallii* and *U. europæus* occur by the coast near Whitehaven, Cumberland. I saw in the Belfast Botanic Garden what I take to be Mackay's *Ulex strictus*. One bush grows near the aquarium, or pond.

Euphrasia Odontites, L., $\alpha.$, and *Juncus maritimus*, Sm., grow near Roundstone.

Lepigonium marinum, $\beta.$ *salinum*? *Scirpus Tabernæmontani*, Sm.? and *Solanum Dulcamara*, $\gamma.$ *marinum*, *Bab.*, grow on Arran.

Orobanche Hederæ, Duby. In a previous number of the 'Phytologist' I have mentioned this plant, doubtfully, as a native of Arran. An examination of fresh specimens on the island removed the doubt. It grows about the ivy-clad low cliffs, or shelves, by Kilronan and its bay.

Helianthemum canum, Dun. I think I have seen this announced as a native of W. Isles of Arran; but I observe the letter E. appended to the description in the 'Manual,' as though it were limited to our island. Although out of flower at the time of my visit, I gathered

some specimens of a *Helianthemum*, not far from the lighthouse, and say 300 feet above the sea, which I must refer to this species.

Melampyrum pratense, L., var. *ericetorum*, *mihi*. Two years ago, while visiting the western districts of Ireland, a hispid *Melampyrum*, occurring in one or two places, on high, ericetal ground, engaged the attention of my friend G. S. Brady and myself. This plant we could not refer either to the *M. montanum* described in Dr. Johnstone's 'Berwickshire Flora' and the 'Manual,' or to the var. *latifolium* of the 2nd edition of the latter work. Although unable to note characters on paper which appear sufficiently marked to render it deserving of specific distinction, I cannot but think it a good variety. With such impression I do not hesitate, after a renewed examination, a few weeks ago, of fresh specimens, to offer it to the notice of botanists as distinct, although to many I dare say it may not be new. I shall very briefly describe the plant, marking by italics the characters which especially form its features. I may add, that I think it possible the var. *montanum* may be but a diminished or altered form of this *Melampyrum*. Plant frequently *equally large* with *M. pratense*, and often coarser and stronger; flowers axillary, secund, in *approximate* or *sub-distant* pairs; bracts varying from lanceolate, ovate-lanceolate to ovate, frequently (in large specimens generally) *with one, two, or three teeth* directed forwards or divergent. *Entire plant more or less hispid*; stem uniformly so (?), although some dried specimens may exhibit traces of a hairy line; corolla four times as long as the calyx; lanceolate teeth and tube of calyx about equal in length; leaves *lanceolate or linear-lanceolate*, under side reticulated; flower large; tube of corolla mostly, in the open flower, *straw-coloured or white*. Growing amongst grass &c., from a little over the sea-level (near Craigga Moina, Roundstone), to say 1000 or 1500 feet, on Ben Bulbin, Sligo. The chief proportion of my examples are from Urrisbeg, at an elevation of perhaps 200 or 250 feet. The pale or white tube of the corolla, although in itself trifling, is very general, and immediately attracts attention to the plant. I am aware, as I noted before, that the paper characters of this variety are but slender; yet I think they are, with a consideration of the *situation*, in one or two respects, of the plant, sufficient. I may mention, that I have no recollection of having observed in the West of Ireland any specimens of *Melampyrum* referrible to the typical *M. pratense*, or in any way different from the plant just described.

Euphrasia officinalis, γ. *nemorosa*, Koch. Specimens of an eye-bright, distinguished by adpressed, crisped pubescence of the stem,

deeply serrated leaves with cuspidate teeth, and slightly pubescent corolla, gathered near Roundstone, are referrible to this variety, the *E. stricta*, *Host.* I am not aware that the typical form of the plant grows in that neighbourhood.

Euphrasia ——— ? On Arran I collected a curious little form, some three inches in height, much branched from near the base ; stem with a minute, adpressed pubescence ; lanceolate or lanceolate-oblong leaves, with one, two, or three strong teeth on each side. I did not know to what species or form to refer it ; but, examples being sent to C. C. Babington, he kindly informs me that he thinks it a form of the *E. gracilis* of Fries, although it strikingly resembles, and possibly may be, *E. Salisburgensis*.

Thymus Serpyllum, L. Specimens of a *Thymus*, uniformly hairy or nearly so, and frequently with distinct, capitate flower-stems, from Arran, belong to this species. C. C. Babington now believes it to be the more common species throughout the country.

Carex punctata, Gaud. Through the kindness of Prof. Blytt my herbarium is furnished with a Norwegian example of this plant, from Arendal. The opinion of C. C. Babington, and an examination of this specimen, convince me that I was in error in naming a *Carex* found on the Cumberland coast *C. punctata*. It is, I suppose, *C. distans*. I named the plant from the descriptions in Koch and the 'Manual ;' and an able botanist, who, however, I believe, was unacquainted with the true *punctata*, coincided with my view. The difficulty of arriving at a correct conclusion in some such matters, without *knowing* one or more of the species concerned, is great indeed, and shows the necessity of great caution before publishing them as facts. I do not purpose at all to dispute that *C. punctata* may be a good species.

Athyrium Filix-fœmina. A curious form of this plant I gathered near the coast northerly from Whitehaven, Cumberland. I enclose specimens to Edward Newman. Perhaps he will kindly subjoin his opinion thereon.*

D. OLIVER, JUN.

Newcastle-upon-Tyne, August, 1852.

* These appear to me to come under the denomination of *monstrosity* rather than of *variety*. They are beautiful, but certainly malformed.—*E. N.*

NOTICES OF NEW BOOKS, &c.

'The Botany of the Voyage of H.M.S. Herald. By BERTHOLD SEEMANN, Naturalist to the Expedition. Part 2. Flora of the Isthmus of Panama. London: Reeve. 1852.'

WE seem scarcely to have completed our notice of the first fasciculus of this important work when a second is laid on our table, not merely equalling, but exceeding, its predecessor in interest. Leaving the uncongenial regions of the north, and the thin layers of vegetable-born and vegetable-bearing soil spread over rock-like masses of eternal, unmelting ice, we must now accompany our energetic and indefatigable traveller to those central and sunny regions of America which are now engrossing so large a share of the attention, the speculation, the hopes, the fears, the enterprise, and the capital of the civilized world; where, three hundred and fifty years ago, Columbus found abundance of gold, pine-apples growing by the sides of the road, and palm-trees producing the most delicious wines; where Nuñez de Balboa first beheld and knelt before the vast Pacific; and where Francisco Pizarro planned and accomplished the conquest of the richest realm then known in the world. During portions of the years 1846, 1847, 1848, and 1849 Mr. Seemann investigated the botany of Veraguas, Panama, and Darien, visiting the entire line of coast on the Pacific side of the Isthmus, and traversing districts where foot of botanist had never previously trodden. We can imagine nothing more delightful than the feelings of a young and enthusiastic man under such circumstances; nothing more exciting or more satisfying than gazing, day after day, on the vegetable glories of those all but unknown realms. No traveller was ever better fitted for his task than Mr. Seemann. He looks at his favourite science of phytology with all the ardour of a devoted lover. Nothing can exceed the assiduity of his attentions, or the careful manner in which he has bestowed them. He has considered his subject in all its bearings. His summaries of the botanical products of the country, whether statistical, economical, or ornamental, are replete with instruction, and bespeak the possession of one of those comprehensive minds which can appreciate at once, and correctly, all the features of the scene before him. Instead of those dry, and shall we say unprofitable, details which have too often filled the pages of works designed as records of the discoveries made under government patronage, and at government expense, we have here a

series of written pictures, presenting vividly to the mind's eye the very scenes which the author himself beheld, and grouping, with exact method, yet with agreeable ease, the characters which communicate to the landscape and the land their greatest interest, alike to the enthusiastic explorer, and the sober, plodding student in the science-halls of distant Europe. But we feel that in instances like these the mere expression of our approbation is insufficient, and that we can only do justice to our author, and at the same time justify our own exalted estimate of his labours, by extracting largely from his instructive pages; and we shall do this without commenting on the particular subjects he has so ably handled, leaving our extended quotations to exercise their own unaided influence on the mind of the reader.

“The aspect of the flora is much more diversified than the uniformity of the climate and the surface of the country would lead one to expect. The sea coast and those parts influenced by the tides and the immediate evaporation of the sea, produce a quite peculiar vegetation, which is generally characterized by a leathery, glossy foliage, and leaves with entire margins. In all muddy places, down to the verge of the ocean, are impenetrable thickets, formed of Mangroves, chiefly *Rhizophoras* and *Avicennias*, which exhale putrid miasmata and spread sickness over the adjacent districts. Occasionally extensive tracts are covered with the *Guagara de puerco* (*Acrostichum aureum*, Linn.), its fronds being as much as ten feet high. Myriads of mosquitoes and sand-flies fill the air; huge alligators sun themselves on the slimy banks, lying motionless, blinking with their great eyes, and jumping into the water directly any one approaches. To destroy these dreaded swamps is almost impossible; the *Avicennias*, with their *Asparagus*-like rhizomata, send up innumerable young shoots whenever the main stem is felled; the *Rhizophoras* extend in all directions their long aerial roots, which soon reach the ground and preserve the trees from falling, after their terrestrial roots have lifted them high above the original level. At Panama, where the tide rises to the height of twenty-two feet, these trees are frequently under water, the heavy surf washing their tops, apparently without injuring or checking their growth; indeed, so well has nature provided for them, that the seed of the *Rhizophoras* begins to germinate while the fruit is yet attached to the tree, and it is not until it has sprouted out to the length of some inches that it drops, as a young plant, into the mud below. Rivers, as far they are subjected to the influence of the ebb and flow, are full of Mangroves and the highest *Rhizophoras*, which, growing always on that side where there is the deepest water, assist

the natives in conducting their canoes through the mud-banks. On the sand of the sea beach the *Ipomæa pes-capræ* grows in wild luxuriance, producing runners often more than two hundred feet long. Higher up, where the ground is firmer, are groves of cocoa-nut palms, poisonous Manzanillo-trees, and spiny *Prosopises* and *Pitajayas*, or thickets of *Crescentia cucurbitina* and *Paritium tiliaceum*.

“Far different is the vegetation of the Savanas. The ground, being level or slightly undulated, is clothed during the greater part of the year with a turf of brilliant green. Groups of trees and bushes rise here and there; silvery streams, herds of cattle and deer, and the isolated huts of the natives, tend to give variety to the scene, while the absence of palms and tree-ferns imparts to the whole more the appearance of a European park than a tract of land in tropical America. The turf is almost as dense as in an English garden, and contains, besides numerous kinds of grasses, many elegant *Papilionaceæ*, *Polygaleæ*, *Gentianeæ*, and *Violaceæ*; the sensitive plant (*Mimosa pudica*, Linn.) prevails in many localities, shutting up its tender leaves even upon the approach of a heavy footstep. The clumps of trees and shrubs, over which the *Garumos* and *Pavas* are waving their large foliage, are composed of *Myrtaceæ*, *Melastomeæ*, *Chrysobalanææ*, *Papilionaceæ*, *Verbenaceæ*, *Compositæ*, *Aristolochiæ*, *Apocyneæ*, and other climbing or twining plants. *Orchideæ* are plentiful in the vicinity of the rivers, where the trees are literally loaded with them. The *Vainilla* (*Vanilla* sp.) climbs in abundance up the stems of young trees, and often increases so much in weight as to cause the downfall of its supporters. The *Chumicales*, or groves of sandpaper trees (*Curatella Americana*, Linn.), form curious features in the landscape. They extend over whole districts, and their presence indicates a soil impregnated with iron. The trees are about forty feet high, have crooked branches—an approximation to the twining habit of the tribe, and their paper-like leaves, if stirred by the wind, occasion a rattling noise, which strongly reminds one of the European autumn, when northerly breezes strip the trees of their foliage.

“Forests cover at least two-thirds of the whole territory. The high trees, the dense foliage, and the numerous climbing and twining plants, almost shut out the rays of the sun, causing a gloom, which is the more insupportable as all other objects are hidden from view. Rain is so frequent and the moisture so great, that the burning of these forests is impossible; a striking difference to those of the temperate regions, where a fire often consumes extensive woods in a very short space of time. Flowers are scarce in proportion to the mass of

leaves with which the places are crowded, and in no respect is the European more disappointed; from cultivating in his gardens none save the choicest and most brilliant flowers which the regions of the sun are capable of producing; from seeing on the stage tropical scenery, which looks more like a representation of fairy-land than of sub-lunar places; and from reading those highly-coloured accounts with which many travellers have endeavoured to embellish their narratives, his imagination has drawn a picture of equinoctial countries which a comparison with nature at once demolishes. The Espave (*Anacardium Rhinocarpus*, DC.) and the Corotu (*Enterolobium Timboïva*, Mart.) are amongst the most gigantic trees, attaining a height of from 90 to 130 feet, and a circumference of from 24 to 30 feet; and no better estimate can be formed of their size, than by an inspection of the port of Panama, where vessels of twelve tons burden, made of a single trunk, are riding at anchor. The forests occasionally consist of only a single species of tree; but generally they are composed of different kinds, the principal forms belonging to Sterculiaceæ, Tiliaceæ, Mimoseæ, Papilionaceæ, Euphorbiaceæ, Anacardiaceæ, Rubiaceæ, Myrtaceæ, and Melastomeæ; these, and the prevalence of palms, tree-ferns, Scitamineæ and Aroideæ, stamp on them the real tropical character.

“Mountains exceeding 2000 feet in elevation, situated principally in Western Veraguas, possess a vegetation which in many respects resembles that of the Mexican highlands; one in which the forms of the torrid zone are harmoniously blended with those of the temperate. Alders and blackberries are found with Fuchsias and Salvias; the brake grows in company with lupines and Ageratums; oaks and palms are intermingled; fine large flowers are abundant. The genera represented are *Styrax*, *Rondeletia*, *Salvia*, *Lopezia*, *Fuchsia*, *Centradenia*, *Ageratum*, *Conostegia*, *Lupinus*, *Hypericum*, *Freziera*, *Galium*, *Smilax*, *Euphorbia*, *Rhopala*, *Equisetum*, *Clematis*, *Chorisia*, *Verbena*, *Condaminea*, *Inga*, *Solanum*, &c. The oaks, like most tropical ones, are scarcely higher than thirty feet, resembling neither in size nor in grandeur those which our heathen forefathers worshipped; their branches are smooth and devoid of that rugged appearance which renders those of the northern species so picturesque.

“The Isthmus is rich in medicinal plants, many of which are known only to the natives, who have ably availed themselves of their properties. As febrifuges, they employ *Chicoria* (*Elephantopus spicatus*, Juss.), *Corpachi* (*Croton*), *Guavito amargo* (*Quassia amara*, Linn.), *Cedron* (*Simaba Cedron*, Planch.), and several *Gentianeæ*, herbaceous

plants, which are known by the name of Canchalaquas. As purgatives are used, Nino muerto, or Malcasada (*Asclepias Curassavica*, Linn.), Frijolillo (*Cassia occidentalis*, Linn.), Canafistola de purgar (*Cassia Fistula*, Linn.), Laureno (*Cassia alata*, Linn.), Javilla (*Hura crepitans*, Linn.) and Coquillo (*Jatropha Curcas*, Linn.). Emetics are obtained from Garriba de pena (*Begonia* sp.) and Frailecillo (*Jatropha gossypifolia*, Linn.). As vulneraries they use Chiriqui (*Trixis frutescens*, P. Br.), and Guazimillo, or Palo del soldado (*Waltheria glomerata*, Presl), and Cope chico de suelo (*Clusia* sp.). Anti-syphilitics are, Cardo santo (*Argemone Mexicana*, Linn.), Zarzaparilla (*Smilax* sp. pl.) and Cabeza del negro (*Dioscorea* sp.). Cooling draughts are prepared from the ferns, Calahuala (*Goniophlebium attenuatum*, Presl) and Doradilla de palo (*Goniophlebium incanum*, Swartz). Antidotes for the bites of snakes are found in the stem and leaves of the Guaco (*Mikania Guaco*, H. B. K.) and the seeds of the Cedron (*Simaba Cedron*, Planch.). Cutaneous diseases are cured by applying the bark of the Palo de buba (*Jacaranda filicifolia*, Don) and Nanci (*Byrsonima cotinifolia*, H. B. K.), and the leaves of the Malva (*Malachra capitata*, Linn.).

“The most dreaded of the poisonous plants are the Amancay (*Thevetia neriifolia*, Juss.), Cojon del gato (*Thevetia nitida*, DeCand.), Manzanillo de playa (*Hippomane Mancinella*, Linn.), Florispondio (*Datura sanguinea*, Ruiz et Pav.), and Bala (*Gliricidia maculata*, Kunth). It is said of the Manzanillo de playa that persons have died from sleeping beneath its shade; and that its milky juice raises blisters on the skin, which are difficult to heal. The first of these statements must be regarded as fabulous, and the second be received with a degree of modification. Some people will bear the juice upon the surface of the body without being in the least affected by it, while others do experience the utmost pain; the difference seeming to depend entirely upon a man’s constitution. Great caution, however, is required in protecting the eyes, for if the least drop enters them, loss of sight and the most acute smarting for several days are the consequence. The smoke arising from the wood produces a similar effect. While surveying the coast of Darien, a boat’s crew of H.M.S. ‘Herald’ was blinded for some days from having kindled a fire with the branches of this tree. Whenever the natives are affected by the poison, they at once wash the injured part in salt water. This remedy is most efficacious, and, as the Manzanillo is always confined to the edge of the ocean, of easy application. It has been stated that the Indians of the Isthmus dip their arrows in the juice of the Manza-

nillo. There are, however, various reasons for doubting this assertion; first, because the poison is, like that of all Euphorbiaceæ, extremely volatile, and, however virulent when first procured, soon loses its power; secondly, because its effect, even when fresh, is by no means so strong as to cause the death of human beings, not even producing, as has been stated, the slightest injury on some constitutions. The statement may therefore be considered as an inaccuracy, and it may rather be supposed that the Indians, like those of Guiana, obtain their poison from the two species of *Strychnos* common throughout Panama and Darien. The fruit of the Amancay (*Thevetia nereifolia*, Juss.) is also considered very poisonous, but its dangerous qualities have probably been over-rated. There is a gentlemen in Panama who, when a boy, ate four of these fruits, without experiencing any other effect than mere griping. The leaves of the Bala, or, as it is also called, Madera negra (*Gliricidia maculata*, Kth.), are used to poison rats. The Florispondio (*Datura sanguinea*, Ruiz et Pav.) appears to have always played, and still continues to play, a prominent part in the superstition of tropical America. The Indians of Darien, as well as those of Chocò, prepare from its seeds a decoction, which is given to their children to produce a state of excitement in which they are supposed to possess the power of discovering gold. In any place where the unhappy patients happen to fall down, digging is commenced; and, as the soil nearly everywhere abounds with gold-dust, an amount of more or less value is obtained. In order to counteract the bad effect of the poison, some sour Chica de Maize, a beer made of Indian corn, is administered.

“Many indigenous plants bear eatable fruits, some of most delicious flavour. * * * * * Several spontaneous productions are used as culinary vegetables. The *Marathrum fœniculaceum*, *H. B. K.*, a plant resembling some of the finer sea-weeds, and growing in most rivers of Veraguas, is estimated so highly by the inhabitants that they have called it *Passe carne*, i. e., excels or surpasses meat; and, indeed, its young leaf-stalks, when boiled, have a delicate flavour, not unlike that of French-beans. The leaves of the Naju de espina (*Peirescia Bleo*, DeCand.) are eaten as salad, either raw or boiled, like the young branches of several *Opuntias* in Mexico; and in a country where, from the nature of the climate, the rearing of lettuces is attended with difficulty, they form a tolerable substitute. The foliage of the Col de Nicaragua (*Jatropha multifida*, Linn.) affords another culinary vegetable, losing, apparently, as do most Euphorbiaceæ, its poisonous qualities by boiling. The seeds of the Chigua (*Zamia Chigua*, Seem.),

a plant abounding in the vicinity of Chirambirà, after having been boiled and reduced to a mash, are mixed with milk and sugar, and thus eaten. A kind of bread is also prepared from them. As condiments for esculent purposes, divers plants are used. The red berries of the Malagueto chico, or Malagueto hembra (*Xylopia frutescens*, Aubl.), are substituted for pepper, especially by the negroes. The fruit of the Vainilla (*Vanilla* sp.) and Vainilla chica (*Sobralia* sp.) are spices employed in flavouring sweetmeats, chocolate, and puddings. The leaves of the Toronjil (*Ocimum*), a common herb, are chopped, and serve to replace our parsley. The most important, however, of all the aromatics to the Panamanian cook is the Culantra (*Eryngium foetidum*, Linn.). It imparts a flavour difficult for a foreigner to relish; but the inhabitants consider it indispensable, and are quite distressed when in the soups and sancoches their favourite condiment has by some accident been omitted.

“Excellent timber for building and wood for cabinet-makers’ purposes abound. * * * * * From the Roble and Guyacan the most durable wood is obtained. The Nazareno, a beautiful bluish fancy wood, the produce of a scientifically unknown tree, would fetch a high price in Europe. The Quira is remarkable for its black and brown streaks. The Corotù and Espavè supply the natives with materials for canoes.

“Dyes the country produces several; a yellow one is obtained from the wood of the Macano (*Diphyssa Carthaginensis*, Jacq.), a scarlet from the leaves of the Hojita de tenir (*Lundia Chica*, Seem.), a blue from the foliage of the Anil silvestre (*Indigofera Anil*, Linn.), a violet from the fruit of the Jagua (*Genipa*), a red from the pulp of the pulp of the Bija or Achotte (*Bixa Orellana*, Linn.), and a black from the seeds of the Ojo de venado (*Mucuna* sp. pl.). A brown colour might be extracted from the *Dichromena pura*, *Nees ab E.*, which abounds in the Savanas, and makes on cotton and linen a stain very much like that caused by the rusting of an iron nail, hence the vernacular name, *Clava*, a nail. The Indians of Southern Darien paint their faces with the colour obtained from the *Bixa Orellana*, Linn., or as they themselves term it, Bija. The scarlet dye observed in the hammocks of Veraguas is not given with the purple shell (*Purpura patula*, Lam.), as the people of Panama assert, but with the leaves of the *Lundia Chica*.

“The cordage which the Isthmians use is solely procured from indigenous plants. The best and whitest is made from the fibre of the Corteza (*Apeiba Tibourbou*, Aubl.). A brownish-looking rope easily affected by dampness, probably because the tree from which it

is taken has saline properties, is manufactured from the Majagua de playa (*Paritium tiliaceum*, Adr. Juss.). The Barrigon (*Pachira Banigon*, Seem.) and the Malagueto hembra (*Xylopia frutescens*, Aubl.) also yield a fibre fit for ropes. The hammocks of Veraguas consist of the fibres of the Cabuya (*Agave* sp.) and those of a palm called Chonta. A strong fibre is contained in the leaves of the Pita de zapateros (*Bromelia* sp.), which is prepared like flax, woven into bags, or chacaras, by different Indian tribes, and extensively used by shoemakers for sewing. The fibre surrounding the wood of the Cucua or Namagua forms a close texture of regular natural matting, which the natives soak in water, beat and make into garments, beds and ropes, or use as sails for their canoes. The mats which the poorer classes have to sleep upon are manufactured from the fibre of plantain leaves (*Musa paradisiaca*, Linn.).

“ Numerous vegetable substances are applied to miscellaneous purposes. An infusion of the leaves of the Tè (*Corchorus siliquosus*, Linn.) is drunk instead of tea, and a similar preparation may be made from those of the Freziera theoides, Swartz, a shrub common on the volcana of Chiriqui. The aerial roots of the Zanora (*Iriarteia exorrhiza*, Mart.) being clad with numerous spines are used as graters, and although they are not so fine as those supplied by art, yet in a country where, from the humidity of the climate, tin ones soon get rusty, they are almost preferable. The natives chiefly employ them when grating cocoa-nuts, which, boiled with rice, compose one of their favourite dishes. The leaves of the Papayo (*Carica Papaya*, Linn.) are a substitute for soap. The wood of the Balsa (*Ochroma Lagopus*, Swartz) being soft and light like cork, is used for stopping bottles; the never-sinking rafts, which at the discovery of South America, caused such surprise among the early adventurers, were then constructed of it and are so still. The fruit of the Palo de velas or candle-tree (*Parmentia cereifera*, Seem.) serves to fatten cattle. * * * Oil is obtained from the fruit of the Corozo colorado (*Elais melanococca*, Gærtn.), and wine, vinegar, food, habitations, clothing, and numerous other necessities of life from the different palms which inhabit the country.

“ Nor is the flora destitute of plants which claim attention on account of their beauty, rarity, or singular configuration. The Espiritu Santo or Holy Ghost plant (*Peristeria elata*, Hook.) bears a flower resembling a dove, and is, like the Flor de semana santa, another Orchidea, almost held in religious veneration, and eagerly sought for when in blossom. The Biura (*Petræa volubilis*, Jacq.) is a flower of

whose beauty those who have only seen it in conservatories can form but an inadequate idea; nothing can be more charming than the sight of whole groves overspread with the long blue racemes of this creeper; it almost baffles description. The Palo de buba (*Jacaranda filicifolia*, Don) is another of those plants on which poets delight to try their pen, and painters their brush. When this noble tree rises on the banks of the river, amidst the dark foliage of a luxuriant vegetation, and waves its large panicles in the air, the foot is involuntarily arrested, and one gazes for some time lost in wonder and admiration."—Pp. 65—72.

‘*Walks after Wild Flowers; or the Botany of the Bohereens.* By RICHARD DOWDEN (RICHARD). London: John Van Voorst, Paternoster Row. 1852.’

The title of this pretty little book is a sad misnomer; it is suggestive of glorious rambles through mead and forest dell, o’er hill and dale, by lake and river, up mountain height and on old ocean’s shore, together with pleasant way-side chit-chat upon the varied floral treasures that await the notice of the wandering naturalist; in short, a ‘Botanical Looker-Out’ adapted to the scenery and localities of the Emerald Isle. Instead of this, however, we have a sort of introduction to the natural system of botany; or rather, the first instalment of such an introduction, for either the Irish “Bohereens” possess a singularly fragmentary Flora, or the author must intend, at some future period, to give us a continuation of his book, which now, like

“Th’ adventure of the bear and fiddle,
Begins, but breaks off in the middle,”

and scarcely there, for we get no further with the wild flowers than to the end of the Brassicaceæ, in the method which the author says “is called that of the natural orders in botany;” and which method, he further tells us, is adopted, *because* his “labour is intended to be more a botanical biography than a systematic production;” this to us however seems to read very like a *non sequitur*, a figure of speech which in the vernacular is usually denominated *a bull*.

As “a botanical biography” then, so far as it goes, this little volume has our hearty welcome. It is replete with pleasant gossip about wild flowers, consisting of lore learned and unlearned, gleaned from a variety of sources, ancient and modern, in reference to their

uses, and their associations, medical, economical, poetical, classical, historical, etymological and mystical: in short, with everything that can be brought to bear any relation, remote or intimate, with the subjects of the biography. Thus, the name of the genus *Brassica*

“Is said to be derived from the Celtic word ‘*bressic*,’ a cabbage; and this derivation from our aboriginal tongue would naturally induce belief, that although a cultivated, and, of course, much modified, group of vegetables, we have always had several of them indigenous. Withering is not content to abide by our Celtic root, but must give it an Attic origin, and, consequently, he derives it from the Greek ‘*brazo*,’ to boil; the operation, no doubt, which is of most importance in making all the *Brassica* tribe useful, for vegetables have been vilified, and called causers of cholera, merely because they were but par-boiled, instead of being cooked.”—P. 162.

Then, a few pages further on, we come to an inquiry into the etymology of the word *cabbage*; and here, says the author,

“Johnson’s Dictionary gives no help, Celtic or Saxon; it merely tells us it is *cabus*, in French; and the French Dictionnaire says that combined with *chou*, *cabus* means hard. Now this is a very hard etymology; but, to assist us on, we find *cabas* to be *la belle langue* for a frail of figs. Well, a drum-headed cabbage is something like the shape of that globe, flattened at the poles; but it is rather a constrained origin for our name. Then the Latin gives us no aid at all; but, come, what joy and dignity it is to find the root of our shunned and repudiated word in undoubted Attic Greek; take courage, then, ‘here you are.’ *Kabe*, food. Do you espy cabbage now? And then follow the words, ‘*kapto*,’ to eat; and ‘*kabos*,’ a corn-vessel or measure—a kind of *cornucopia*, which might indicate that true Irish union, so well sketched in the song of William Maginn, viz:—

“ ‘Pigs galore, magra asthore,
And cabbages, and ladies.’ ”

—P. 192.

As a relief after the perusal of this dry disquisition upon the derivation of a very familiar word, we must quote here the amusing abstract of some learned Irish scholar’s researches into the history of the wild field cabbage (*Brassica campestris*), wherein our readers will find, we flatter ourselves, some truly unexpected revelations of and concerning a very primitive use of cabbage-leaves, for which we think they could scarcely have been prepared. Of this member of the family, as Mr. Dowden says, “authors write but little: where two

travel on a horse, one must go in front ; and so it is with these cross-words—the younger brother, the cabbage, carries away the public attention and position by his greater usefulness. *Brassica campestris* has scarcely a thought given it, except by our faithful historian, Gerarde, who says, that ‘ wild colewort hath broad leaves not unlike to the tame colewort, but lesser, as is all the rest of the plant ; is of nature wild, and, therefore, not sought after as a meat.’ ” But to our quotation :—

“ A good ‘ Irishian,’ as a scholar in ‘ the vernacular ’ is styled, is always somewhat of a Latinist besides ; and, holding it as undoubted that the more juvenile tongue is no other than the Celtic cloaked in Æolic terminations, our ancient philologer never looked into Ainsworth until he had first sacked O’Reilly, having found the hard Celtic word *Bresic*—meaning a tegument, and softened down into *Brassica*—he announced it as the origin of the northern Irishman’s (*vulgo*, the Scotchman’s) mode of designating his inferior garments, or ‘ breeks.’ Getting on thus to the specific distinction of our plant, *campestre*, he finds a second explanation in addition to that of a ‘ flat field,’—it also means ‘ *tegmen*,’ a covering, an apron ; upon this hint our Irishian pronounced he had discovered why early Celtic writers had repudiated the notion that mere fig-leaves supplied materials for the primitive tailoring of Paradise. Thus does our bold Hibernian scholar and antiquary triumphantly prove, that it was not in a paltry plication of fig-leaves Adam and his Eve enveloped themselves, but they fetched from their vegetable garden the superior substantiality and size of cabbage-leaves, which were laid in folds around them for a cincture. He neatly shows that the kilt was continued from that paradisaical era by the Irish, although now worn chiefly by the Scottish branch of the Celtic people ; and also thinks that the variety of *Brassica* called red cabbage may have been alternated in the petticoat, with the greener leaves as a tasteful variety, in this ancient vegetable tartan ; which, being cool and comfortable, would be suitable enough in a warm Eastern climate.”—P. 181.

The pretty little awl-wort (*Subularia aquatica*) furnishes an appropriate allusion to one of the sweetest of Moore’s ‘ Irish Melodies.’ Of this “ paddling pet of the mountain ponds,” our author observes, “ we do not find much to remark,” since

“ It has not won a reputation in medicine-mongering or witchcraft. Like the citizen in ‘ Julius Cæsar,’ it might say, if it could speak—‘ Truly, sir, *all* that I live by is with the *awl* : I meddle with no tradesman’s matters, nor women’s matters, but with awl.’ It has, in

fact, only its name and its form, without a history of any economical kind whatever. We do, it is true, know of a certain *water-cobbler*, but he could not get at our *awl-wort*, for he lives in the sea, and the mountain ponds or elevated lakes are inaccessible to him; with this difficulty before us, we cannot draw our plant into a legend with any facility, so we must record its residence in our poet Moore's lines, which will give it some touch of immortality:—

“ ‘ On Lough Neagh's banks as the fisherman strays,
At the cold clear eve's declining,
He sees the round towers of other days
In the waves beneath him shining.’

“ Close by stones and broken rubble, where the poet may imagine ancient fallen towers lie half imbedded in the lake, the *Subularia* appears; it is the Irish rush-cress—an admirably adapted name, constructed from its rush-like leaves and its cress-like blossom. This interesting little native ought to be in every aquatic garden. If planted in a pot of gravel with a little clay, and sunk in a quiet stream, it will grow readily; and then may be noticed by the curious, with facility, the unique fact of a flower in full bloom under the water. It is very probable, however, that the distribution of the pollen on the stigmas takes place before the petals open, and that in this way impregnation is secured; although the most usual fertilization of seeds takes place after the flower expands in the air.”—P. 227.

Having now accompanied our author as far as the *awl-wort*, with which his present volume concludes, so now must we also conclude, by saying that taking it “for *all* in *all*,” we can conscientiously commend the book to the notice of our readers, as being in a great measure calculated to increase the number of admirers of those floral treasures which are so profusely scattered among the green lanes, the “little roads” and bye-ways of our native land. As in this, our wishes coincide with his own, we may almost take for a motto to our annual volume the following passage, in which we take leave of the ‘Walks after Wild Flowers.’

“I want,” says the author, “to give pleasure to pedestrians; I want to make them god-fathers and god-mothers to all the new births of the teeming spring, and to call them by their names, and know them, and by taking knowledge of them to love them. I want every summer flower to be appreciated; and the seed and fruit of autumn to be understood and welcomed; as to winter, when it comes, for the season which is truly naked and bare never comes in our emerald isle, the

‘dead season’ is yet fully alive to him who observes nature even as it ‘Grows again tow’rd earth.’—P. 4.

By the way, though, we were all but ungallant enough to omit to mention the tasteful frontispiece to the volume, although the same is from the pencil of a lady. It represents four members of the Ranunculaceous order, each surrounded by an emblem of its peculiar habitat, and the whole inclosed in an ornamental border. It is very pretty and very appropriate.

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Thirty-sixth Sitting.—Saturday, August 28, 1852.—MR. NEWMAN, President, in the chair.

The President, in reply to a note received on the subject, wished to avail himself of the opportunity of stating that the Phytologist Club was strictly confined to those under whose immediate superintendence the ‘Phytologist’ was published, and that the printing of its proceedings was adopted as a ready means of communicating to the public those passing observations which had not the formality, or, in the eyes of their authors, the importance, of prepared communications, but which he thought were worthy of being thus rescued from oblivion.

Thlaspi alpestre.

The President mentioned that he had received from Mr. Thomas Clark, of Halesleigh, Bridgwater, seeds of *Thlaspi alpestre*, gathered on the Mendip Hills, between Sidcot and Shipham; and that he had forwarded them to Mr. Borrer, in accordance with a request on the wrapper of the ‘Phytologist’ for August, 1851.

Anther-cells of Chrysosplenium.

The President read the following observations on this genus, communicated by Mr. W. H. Purchas, of Ross, dated August 21, 1852:—

“I have frequently examined fresh specimens of *Chrysosplenium oppositifolium* from this and the adjoining counties; but I never could verify the statement, which Mr. Babington has apparently adopted

from Koch, that the anthers of this genus have only one cell, and perhaps ought to be considered as four or five, divided to the base of their filaments. I have always found them two-celled; and this structure was, on account of the greater size of the floral organs, still more obvious in specimens of *C. alternifolium* sent me last spring, in a fresh state. The connective is distinctly visible up to the apex of the anther, separating, though not projecting beyond, the cells; the valves gape widely after dehiscence; so that a cross section of the burst anther has nearly the figure of the letter x. I have examined a number of British and some foreign writers, all of whom agree in describing the anthers as two-celled, either generally in the ordinal characters, or specially under the genus or species. Amongst these are Grenier and Godron, who, as they have written since the publication of Koch's work, cannot have been ignorant of his statement, or be supposed to have made an opposing one without special examination of the plants, as we might perhaps have fancied that older writers had done. The figures in 'English Botany' and Curtis's 'Flora Londinensis' represent the anther two-celled. Can they be variable in this respect, occasionally imitating what is said to occur normally in *Leparrhena*?"

Myosotis strigulosa.

The President read the following note, from Mr. C. C. Babington, dated August 21, 1852:—

"I see that Mr. Watson has formed an opinion that the plant found by Mr. Davies in Cumberland is *Myosotis strigulosa*, *Reich.*; and I have much pleasure in being able to concur with him. Having authentic specimens of the plant (*Reich. Fl. Exsic. No. 2051*), and access to Reichenbach's own plate of it (*Sturm's Deutsch. Fl. 42, 3*), I have placed Mr. Davies's specimens (for which I am indebted to him) side by side with them, and find that they agree, with the exception of an error in the latter, pointed out by Reichenbach himself, in his *Fl. Excursoria*. The plant is considered as a distinct species by Reichenbach, Roth, Van den Bosck, and some others; but I think that it is only a form of *M. palustris*, as do Koch, &c."

Veronica palustris.

The President said that several inquiries had been made as to a plant mentioned by Messrs. Lloyd and M'Ennes under this name at p. 636. He begged of the authors of the paper in question to give the required information.

Myosotis near Balcombe.

The President hoped that the botanists referred to would also kindly transmit specimens of this supposed new species, that he might transmit them to Mr. Watson and Mr. Babington for identification.

Monstrous Form of Trifolium repens.

The President read the following extract of letter from Mr. T. G. Littleboy, of Bourne End, Hemel Hempstead :—

“Enclosed are specimens of a leguminous plant, which differs from any species of *Trifolium* with which I am acquainted. The most distinctive characteristics are the great length of the pedicels and the leaf-like segments of the calyx, the long and erect or ascending peduncles, and the curved legumes. It was found in a cart-track near this place.”

* The specimens sent were evidently monstrosities of *Trifolium repens*, in which not only the sepals, but some of the petals also, had assumed the character of monster leaves. Such instances are not very uncommon.

Lastrea uliginosa.

The President wished to record a fact, remarkably in accordance with Mr. Moore's observation, published in another part of this number, on the same subject. He had possessed for at least six years a plant of that form of *Lastrea* usually known as *cristata*, but to which he had wished to restrict the name of *Callipteris*, as assigned by Ehrhart. This plant originally came from Bawsey, and was most rigidly typical of its kind. Cultivated in a dry London atmosphere, it had strictly retained its original characters, except that, getting weaker year after year, it has grown “small by degrees and beautifully less.” The weather at last proved too dry; and this individual plant was planted in bog-earth, abundantly supplied with water, and placed in a closed greenhouse, where the thermometer frequently rose above 90° Fahr. Its growth became vigorous in the extreme; but this was not all: frond after frond appeared, each receding more than the last from the typical figure of *Callipteris*, and approaching that of *uliginosa*; and at the present moment it has fronds, evidently from the same cormus, which would serve admirably as representatives of both supposed species. He wished to insist on nothing, to draw no conclusions, but to invite others to experimentalize in the same manner.

Aconitum Napellus in Glamorganshire.

The President read the following note, from Mr. George Maw, of Worcester, dated August 11, 1852 :—

“I think it is not generally known that *Aconitum Napellus* is a Glamorganshire plant. When travelling last April on the S. Wales Railway, I was astonished at the great abundance in which it was growing on both sides of a stream which is crossed several times by the rail between the Llantressant Station and Cardiff. At the time I saw it, it was only six or seven inches high, but growing in such profusion that the banks were quite covered with its emerald-green foliage for a distance of at least six miles. I should have recorded its occurrence in this locality sooner, but on mentioning my supposed *discovery* to Mr. Moggridge, of Swansea, I found he had published the locality several years ago. I think there cannot be the least doubt about the plant being truly wild in the counties adjoining the estuary of the Severn. One two localities have been recorded for it in Somersetshire; and I believe it has been found near Sapperton, Gloucestershire, at the head of the Stroud Valley, which is, I should think, a similar locality to that in Monmouthshire, described by Mr. Hort in the ‘Phytologist’ for August. The formation is oolitic instead of carboniferous limestone. When a plant like the present is found distributed through a number of *adjoining* counties, is it not strong evidence in favour of its being a native? I once found *Aconitum Napellus* in Aske Wood, near Richmond, York; but there it was associated with such suspicious characters (*Geranium striatum* and *Saxifraga umbrosa*) as to make it probable it had been introduced. Would not the Forest of Dean be a likely locality for the occurrence of the monk’s-hood?”

Lastrea cristata, *L. Thelypteris*, *L. spinosa*, *Equisetum Wilsoni*, &c.

The President read the following extract from a letter addressed to him by Mr. R. W. Rawson, B.A., of Humberstone Grammar School, near Great Grimsby, dated August 11, 1852 :—

“Thinking that it may not be uninteresting to you to hear that I found *Lastrea cristata* in Wybunbury Moss, as indicated in your book on British ferns, I thought of making this communication some time since, but have hitherto neglected. I am now reminded of my original intention by seeing that a paper has just been read on *L. cristata* at the meeting of the Botanical Society. I enclose two small, imperfect fronds of *L. cristata*, gathered in October, 1850; two of *L.*

spinosa ; and a specimen of *Equisetum Wilsoni*. The last was gathered near Mullingar, in Westmeath, in February, 1850. It grows abundantly by the edge of the canal there. *L. spinosa* grows abundantly in boggy ground in the neighbourhood of Whitchurch, Salop. The difference between it and *L. multiflora*, growing side by side, is almost as marked as that between two different species can be. *L. Thelypteris* grows abundantly in Quoiseley Meres, near Whitchurch, and in Wybunbury Moss, near Nantwich. I found *Botrychium Lunaria* in a field near the canal at Whitchurch. *Osmunda regalis* grows plentifully in that neighbourhood."

The President read the following extracts from a letter from Mr. Watson :—

Asplenium germanicum in Northumberland.

"To-day I received two fronds of *Asplenium germanicum*, gathered by G. R. Tate, on Kylœ Rocks, Northumberland."

Lastrea uliginosa not in Kincardineshire.

"*Lastrea uliginosa* has *not* been found in Kincardineshire. It appears that Mr. Syme had inadvertently marked its name in a 'London Catalogue' instead of *L. dilatata*."

BOTANICAL SOCIETY OF LONDON.

Friday, August 6, 1852.—John Reynolds, Esq., Treasurer, in the chair.

Amongst the donations announced to the library was the third volume of 'Cybele Britannica,' by Hewett Cottrell Watson, Esq.; presented by the author.

A paper 'On *Lastrea cristata* and its Allies,' by Mr. T. Moore, F.L.S., was read (see p. 672).—*G. E. D.*

Rich Locality of Plants on Wandsworth Common.

By MR. K. M'ENNES.

RICH indeed is the locality to which I am about to call attention, both in the number of native plants not previously known to this district, and in others which have made their re-appearance after an absence of several years.

Some weeks since, my attention was drawn to the cutting through which passes the London and South-Western Railway, crossing Wandsworth Common. Near the bridge by which the Tooting road passes over the line, is a piece of land belonging to the Company, which has been excavated to a considerable depth in procuring ballast for the use of the line. Here, at a depth varying from perhaps ten to twenty feet, upon the newly-exposed gravel and the underlying marly formation, have sprung up plants of an interesting character; interesting from their rarity in this neighbourhood, and interesting in one instance for the re-appearance of a plant which had been lost to the Common for many years, *viz.*, *Drosera rotundifolia*. Grouped together in this small portion of ground, occur plants from a diversity of soils and geographical positions.

As one of the most interesting, I will begin with the *Lycopodium inundatum*, which is fine in growth, and in tolerable abundance, associated with its usual attendant, *Drosera rotundifolia*. We have also *Ranunculus circinatus*, *R. Flammula*, *R. repens*, *R. acris*, and *R. sceleratus*, *Nasturtium officinale* and *N. terrestre*, *Sinapis alba*, and *Senebiera Coronopus*, in moist parts; on dry, sandy soils near the top, *Sagina apetala*, *Alsine rubra*, *Malva sylvestris*, and *Hypericum humifusum*; *Geranium pusillum*, *Vicia Cracca* and *V. sativa*, in numerous places; *Potentilla Tormentilla* and *P. anserina*, *Oenothera biennis*, and *Medicago sativa* extend directly across the Common, for at least half a mile, on each bank of the railway; *Fœniculum officinale* is also plentiful for a great distance, in company with *Melilotus leucanthus*; on the more stiff soil in the lower parts are *Helminthia echiioides*, *Hypochaeris radicata*, *Tussilago Farfara*, *Dipsacus sylvestris*, *Daucus Carota*, *Achillea Millefolium*, *Chrysanthemum Leucanthemum*, *Plantago lanceolata* and *P. major* (with *P. Coronopus* on the drier parts), *Rumex obtusifolius* and *R. crispus*, *Anthemis nobilis* and *A. Cotula*, *Gnaphalium uliginosum*, *Carduus lanceolatus*, *Scutellaria minor*, *Radiola millegrana*, *Trifolium pratense*, *T. repens*, *T. Ornithopodioides*, and *T. procumbens*, *Medicago lupulina*, *Lotus major*, with var. *β. glabriusculus*

of Babington, and *L. corniculatus*, *Lathyrus pratensis*, *Mercurialis annua*, *Polygonum amphibium*, *P. Persicaria*, and *P. aviculare*, *Carex flava*, and, I believe, *C. teretiuscula*, which was in a damaged state.

In some of the lowest portions, in which water remains more or less, may be found *Juncus conglomeratus*, *J. glaucus*, and *J. bufonius*, *Typha latifolia*, *Alisma Plantago*, *Actinocarpus Damasonium*, *Villarsia nymphæoides*, *Phragmites communis*, *Inula Conyza*, *Bidens tripartita*, *Epilobium parviflorum*, *E. hirsutum*, and *E. palustre*, *Senecio viscosus*, *S. Jacobæa* and *S. erucifolius*, *Linn.* (*S. tenuifolius*, *Smith*), *Sonchus palustris*, *Myosotis cæspitosa*. The ground is covered with *Hydrocotyle vulgaris*. In several places *Campanula rotundifolia* has established itself very fine; two *Ericas*,—*E. cinerea* and *E. vulgaris* (or *Calluna*),—*Chenopodium album*, and *Equisetum palustre*, *E. arvense*, *E. fluviatile*, and *E. Telmateia* are very flourishing. Among the Gramineæ the following genera have representatives in this spot:—*Alopecurus* (*A. pratensis* and *A. geniculatus*), *Phleum*, *Agrostis*, *Aira*, *Avena*, *Holcus*, *Poa*, *Dactylis*, and *Nardus*; and I believe there are others, if searched for. In regard to trees, *Betula alba*, *Populus alba*, and others, as yet in a young state, occur. There are at least ten different forms of willows; and I cannot make more than half of them agree with either Withering, Smith, Lindley, or Babington, or with any living plant in the Kew collection. One of them, near to *Salix caprea*, is identical with their *S. candidula*.

At the time of my first botanizing the ground, there were about six fine roots of one other plant,—*Orobanche minor*,—on the clay. I gathered one specimen, intending to leave the remainder for others; but some children who had been watching my actions in gathering different plants, as soon as I was gone to another part of the ground, came into the pit; and unfortunately the *Orobanche* attracted their notice. Before I could reach the spot they had culled the whole of them, and were descanting among themselves upon the (to them) peculiarities of the plants. They were not *perceptibly* growing upon any plant.

And now let me inquire, by what means came such a large number of plants, of the rarer kinds, to establish themselves on this small space of ground, and many of them quite new in this district?

The *Lycopodium inundatum*, for instance, has never been seen upon the Common in the memory of any of the botanists who have investigated it for the last twenty years; neither have I seen it nearer than Walton Heath. It is certainly recorded (Cooper's 'Flora Metropolitana') as growing upon Wimbledon Common; but I should much like to see it there, or know those who have. Here it is now, and in tolerable plenty, growing upon a spot which was, until the formation of

the railroad, one of the driest upon the Common. Then *Drosera rotundifolia* has grown upon some parts before, but disappeared, many years since, from all parts of the Common, and re-appeared in this, in the midst of *Sphagnum* and *Hypnum*, &c., where it certainly was not before. With regard to *Equisetaceæ*, *E. Telmateia* is growing in several places, and as abundant as though it had been established here for the last century; yet it is impossible it could have existed here previous to the formation of the railway. *E. fluviatile* was not, I think, known before upon the Common; *E. palustre* grows a quarter of a mile distant; *E. arvense* is too abundant as a weed. *Orobanche minor* is at home in a clover-field; but who previously saw it on a heath or clay common, and not apparently parasitical? It may be argued that *Fœniculum* and *Cœnothra* are garden escapes; but where *was* the garden from which the seeds escaped?—as, before the cutting, the whole distance it occurs in (more than half a mile) was the plain Common clothed with gorse and heather. The *Melilotus* is abundant, in company with the *Medicago*, in the same direction as the *Fœniculum*, *Helminthia*, additional *Leguminosæ*, &c.; and if one has escaped they have all done so, but *where from*? Many of the plants are apt to spring up in similar situations; still, upon examination we appear to have somewhat above the average share upon so small a space of ground.

Let us take a candid view of the locality, and note the vast and likewise varied number of plants, usual tenants of directly opposite soils and habitats, which are found assembled together. Commingled as they are, *where*, *when*, and *by whom* will that difficult task be attempted, of drawing the line of demarcation between cultivated and uncultivated plants? The seeds have probably remained inert from the time the deposition of the marl and gravel took place, caused by the physical revolutions the earth has undergone, and upon their exposure again to the action of the atmosphere were re-called into life.

In proof of my views I may mention, that in many places on the Richmond line, where the ballast was taken from the cutting in question, many plants uncommon to the district have appeared upon the embankments, identical with those in my list.

P.S.—*Phalaris arundinacea*, β . *variegata*, is growing near *Lycopodium inundatum*.

K. M'ENNES.

Vauxhall, August, 1852.

A few Observations on the Fungus-Blight in Wheat, founded chiefly on the Discoveries of Fontana and Sir Joseph Banks, and addressed to the Phytologist Club, on the 25th of September, 1852.

By EDWARD NEWMAN.

I HAVE had an unusual number of letters from the country on the blight in wheat, many of them probably addressed to me in consequence of my known attention to blight generally, and totally without reference to my editorship of the 'Phytologist.' Many of them are little more than inquiries; and I think I may say that none were intended for publication. Still, I take this opportunity of addressing a few general observations in reply, believing that when printed and circulated they may excite some interest among those whom the blight more especially affects. I will in the outset take leave to remark, that I have in almost all instances observed too great a tendency on the part of wheat-growers to speculate on remote causes of blight, and too small a disposition to make those observations, and try those simple experiments of manure, season of sowing, rotation of crops, variety of seed, &c., which offer possible, and even probable, chances of prevention or cure. With regard to speculation on remote causes, I have been really grieved to find in how many instances the wildest hypotheses have been currently received in place of facts clearly and positively ascertained. Science has done all in her power to inform the farmer aright; and the farmer has done nothing whatever to assist Science in her investigations. It is impossible for a scientific man to converse with a farmer on any subject connected with the well-being of his crops, without finding that he who ought by his position and opportunity to be the practical man, is in reality the most ignorant and wild of theorists; while the man of science, who might, from his occupation among books, and his closet-study, be supposed the theorist, is in reality the practical man,—has indeed possessed himself of that knowledge of Nature's laws which the farmer, whom those laws especially concern, has been totally neglecting. I allude to this subject with much regret, the same conclusions having been forced on my mind repeatedly before, during my prolonged examination of the insect-blight of turnips and other crops.

The blight which has lately proved injurious to the wheat is none other than that described so accurately by Felice Fontana, an Italian, in 1767, and subsequently figured by Sowerby, in his 'English Fungi,'*

* Under the name of *Uredo Frumenti*, t. 140. It is the *Puccinia Graminis* of Persoon.

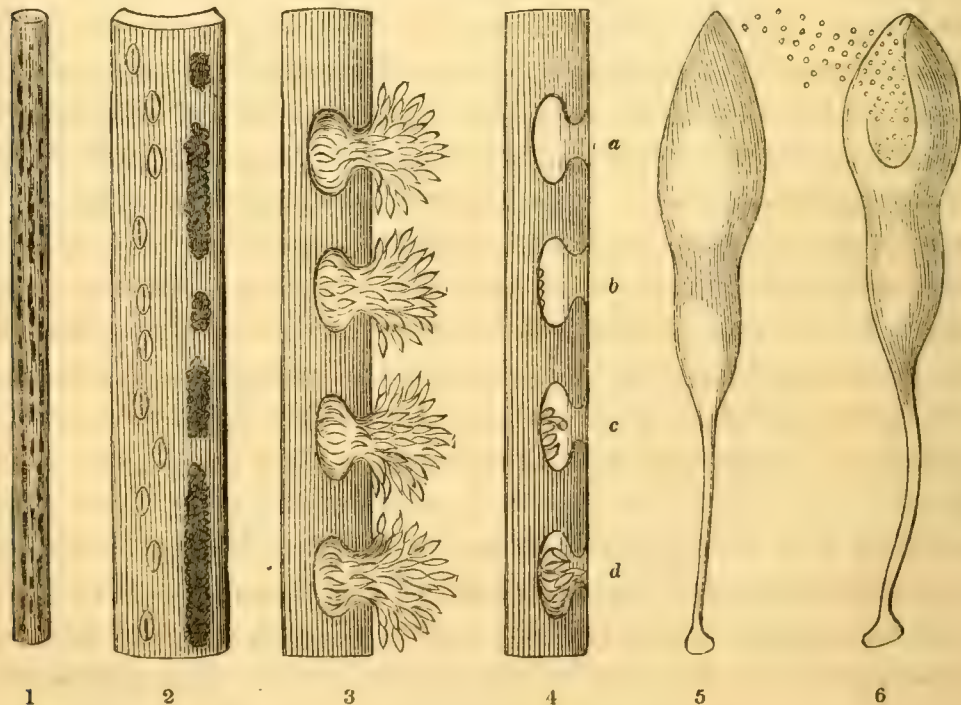
together with the corn and grass which it infects ; but the best and most complete account is that given by Sir Joseph Banks, in 1805, which, at the time of publication, was largely circulated among agriculturists, and which really exhausted the subject, leaving nothing more to be learned respecting its history. The pamphlet is intituled ‘ A short Account of the Cause of the Disease in Corn called by Farmers the Blight, the Mildew, and the Rust.’ Every part of the history of this minute parasitic fungus was traced ; and beautifully accurate figures of it, in all its stages, accompanied the description. I will attempt to give an outline of the discoveries of Fontana and Banks, as far as confirmed by my own observations.

Sir Joseph Banks prettily observes that a plant, being fixed in the ground by its root, is differently circumstanced from an animal which can move from place to place. The plant must have its nutriment, of whatever kind, brought to it ; the animal travels from place to place in search of its food. The food of the plant is fluid ; the food of the animal is solid. The mouths of the plant are innumerable ; they are distributed over its whole surface ; they are excessively minute, and only to be seen by the aid of the microscope : their presence, form, and peculiarities have long been familiar to the botanist, although it is now considered that respiration rather than nutrition is the function for which they are intended ; they are shut in very cold and very dry weather, but open in wet weather ; and when the weather is at the same time wet and warm, the plant is in the very best state to receive its atmospheric supplies. Such is the character of what are called by botanists exogenous or endogenous plants ; and wheat, barley, oats, and rye are endogenous plants.

There is another class, or division of plants, called thallogenous. Amongst these are what are vulgarly called funguses, mushrooms, toadstools, puff-balls, &c. A very great number of these are minute and parasitical, or living on other plants. These are increased by seed, which is so excessively small as to float about in the air. If we break open a puff-ball, we may see millions on millions of these little seeds, issuing forth like smoke from the bowl of a tobacco-pipe. In the latter part of summer the air is filled with such seeds ; and in warm and moist weather their quantity is increased tenfold. The blight of the wheat is one of the smallest of these funguses ; and its seeds are of course infinitely smaller than the fungus itself.

We have, then, a field of wheat, in warm, damp, summer weather, opening its pores, or mouths, to receive the moisture. We have at the same time a damp atmosphere, charged with countless myriads of the

seed of a minute fungus, whose nature it is to grow on the wheat-straw. Nothing, therefore, is more easy than for the seeds of the fungus to be carried by the wind against the wheat-straw, which is the natural substance from them to grow on. Nothing is easier than for these minute seeds to enter the mouths of the wheat-straw, now widely opened, as if purposely to receive them. This result, which appears so probable, so much a matter of course, does actually take place. On making a section of a fragment of wheat-straw, cutting it perpendicularly downwards, you may perceive, by the aid of a microscope, the little cavities into which the mouths open; and in these cavities you will also find the minute seeds of the fungus, just beginning to grow. By examining a great number of these little cavities, you will find the fungus in a hundred different states, varying from that of a mere seed to that of perfect plants, clustered together by scores, and squeezing a passage through the mouths into the open air, where they burst, and discharge seed, ripe and ready for further mischief. The shape of a perfect fungus is exactly like that of the unexpanded blossom of a Fuchsia; and when quite ripe the upper part becomes more globose, splits open, and the seed issues forth.



In order to make this matter perfectly clear to every comprehension, I have prepared some rather coarse, but certainly characteristic, diagrams of this disease. Fig. 1 represents a portion of blighted wheat-straw, of the natural size. Fig. 2 is a small portion of straw,

cut out with a pen-knife, and magnified with a moderately high power. On the left hand the little oval figures represent the mouths (or stomata, as botanists call them) in a healthy state ; on the right hand the mouths are represented as choked up with the fungus. Figs. 3 and 4 represent still smaller fragments of straw, cut down longitudinally with a sharp knife, so that a section only is exhibited. These two fragments are of exactly the same size, and are magnified very highly. In both instances the knife has passed through four stomata, or mouths, and has exposed the little cavities in the substance of the straw to which these openings lead. Those in figure 3 are represented as entirely filled with the fungus, which has forced itself through the openings, and has somewhat the appearance of four short wheat-sheaves. In the cells or cavities marked *c* and *d*, the fungus is in a much younger state ; while at *b* the seeds only are visible at the bottom of the cell ; and the cell *a* is entirely free from the parasite, and in a perfectly healthy state. Fig. 5 represents a single fungus, in its full-grown and mature state. It is now enormously magnified. Finally, fig. 6 is another mature fungus, which, having split open with its perfect ripeness, is dispersing its seeds in the air. At the end of the stem of the fungus is a little lump or bulb, by which it is attached to the straw. Neither Fontana nor Banks, nor, indeed, Bauer (the gifted microscopist and draughtsman, to whom Sir Joseph Banks was indebted for his admirable and most accurate figures), has mentioned or drawn the roots of this fungus ; but it is so well known that all Fungi have minute roots (or mycelia, as they are termed), permeating every substance on which they fix, that I cannot doubt that the straw of blighted wheat is also permeated by them, and that the fungus increases by this means also as abundantly as from seed ; a view that seems almost established by the fact, that in some instances the outer cuticle of the wheat-straw is split and broken up in all directions by the multitude of funguses which are pressing outwards to gain access to the air.

Botanists term that part of the leaf of wheat and grasses which covers the stem a sheath ; and these sheaths are equally furnished with mouths, and therefore equally subject to the blight with the straw itself ; they receive the seeds of the blight, and grow it in their own mouths, not allowing any passage for it to pass through and injure that part of the straw which they conceal. This fact may be established to the satisfaction of the most superficial inquirer by stripping the sheath off the straw, when the portion which it had covered will be found perfectly healthy, clear, and free from blight. Hence to barley, in which

the sheath usually covers the stem, the injury caused by this blight is scarcely perceptible.

The effect of this fungus when on the straw is to divert the sap from its proper channel, to waste it in supporting a parasite, and thus to starve or impoverish the grain, which nevertheless always ripens, although sometimes so reduced as to produce little else than bran when it is ground. In all fruits and vegetables that have long been under the care of man, and applied to his uses, the fleshy and nutritious parts have been purposely and studiously increased. The apple, pear, plum, cabbage, turnip, and carrot are familiar illustrations of this fact. And, although we are unacquainted with wheat in a natural state, or, as it is termed, as a wild plant, it may be assumed that the quantity of flour contained in a grain of wheat has been greatly increased by cultivation. It is certain that Nature does not require so much for the healthy germinating of the seed; for every grain of blighted wheat (I speak of this rust, or straw-blight) will germinate readily; and the plant which it produces has no predisposition for blight. There is, therefore, a positive advantage in procuring thin or starved wheat for sowing, because an infinitely greater number of grains go to the bushel. It is, however, the general, and, I may add, the unwise, practice to select plump wheat for seed, thus sacrificing an immense amount of human food, and gaining no proportionate advantage as regards the future crop. I have often seen the light wheat given to fowls, as not being good enough to use as seed. The flour in a grain of wheat is doubtless provided for the especial purpose of nourishing the young plant until it can draw nutriment from the air, and from the soil. Immediately the spark of vitality is called into action, the seeds send a little spear, or plumule, upwards to the air, and a little root, or radicle, downwards into the ground. But for some days, and while these are growing most rapidly, they derive no support from extraneous objects; and it is then that the flour contained in the grain constitutes the food on which they live. But this flour is required only for a short time, and in small quantity; for as soon as the infant plant can feed on extraneous fluids it no longer requires the flour in the grain, and consequently whatever exceeds the exact quantity required must be wasted. This fact in vegetable physiology should ever be remembered by the farmer.

When a great and obvious injury is done to us, the discovery of the source, or cause, or author of that injury is a necessary preliminary step to prevention. If a house is robbed, and we discover the thief, we have achieved something towards a prevention of the recurrence

of the theft ; and if we discovered how he entered the house we may fairly and wisely set our wits to work to blockade that entrance. Now I think it can hardly be denied that this precise, and exact, and laborious tracing out of the cause of the straw-blight,—this finding out of the thief, and how he entered,—is in itself a preliminary step to a cure ; and such discoveries are not useless because unaccompanied by an empirical announcement of a cure.

EDWARD NEWMAN.

Devonshire Street, Bishopsgate,
September, 1852.

Excessive and noxious Increase of Udora Canadensis (Anacharis Alsinastrum). By W. MARSHALL, Esq.

I SEND you a series of four letters on the *Anacharis Alsinastrum*, which I have just had re-printed from our local paper, for private circulation. The sudden appearance of the plant in the Cam, and its most prodigious powers of increase, have invested it with much local interest, seeing that in this fenny country we can only exist by maintaining a free and unimpeded drainage.

The first two letters only contain a short history of the several discoveries of the plant in this country, for the greater part of which I am indebted to the pages of the 'Phytologist.'

The third letter is devoted to the peculiar behaviour of the intruder in our rivers here, and the mischief which has already ensued to navigation, drainage, boating, swimming, angling, and fishing. The fourth discusses the questions, whence it came, how it got to Britain, how it reached the Cam, and how it is to be got rid of. If your readers should not agree in my view of its first introduction, an opportunity will be afforded of discussing and clearing up the matter.

I think the undoubted fact of its being an importation into the Cam so recently as 1848—1849, and its marvellous development since, a most interesting feature in its history, because it shows the mischief the plant is capable of doing in a very limited time, and goes a long way to prove that it cannot possibly be indigenous, because such a plant could never have been overlooked.

W. MARSHALL.

Ely, September 16, 1852.

Letter 1.

A remarkable plant has recently made its appearance in the rivers Ouse and Cam, and already abounds to such a degree as not only to impede navigation, but, what is of far more importance in this fen country, threatens to injure our drainage.

It occurs in dense, tangled, submerged masses, of considerable extent, and is so heavy that when cut, instead of rising to the surface and floating down to sea, like other weeds, it sinks to the bottom. It is this property which is likely to make it injurious to drainage. The intruder is so unlike any other water-plant, that it may be at once recognized by its leaves growing in threes, round a slender, stringy stem. The watermen on the river have already dubbed it "water-thyme," from a faint general resemblance which it bears to that plant.

That it is new to our rivers here is certain. Watermen and fishermen pronounce it to be (as I heard one of them call it the other day) "a furreigner."

Who the stranger is, whence he came, and how he got here, are questions of considerable scientific interest; but by what means he is to be got rid of is the practical question. With your permission I will discuss these points in another communication.

Letter 2.

I now trouble you with the second part of my communication on the subject of this new water-weed, in which I promised to discuss, who the stranger is, whence he came, how he got here, and by what means he is to be got rid of.

With respect to the first question, it is sufficient to say that it is the *Anacharis Alsinastrum* of your eminent townsman, Mr. C. C. Babington (to whose accurate labours our indigenous botany is so much indebted), who so named it in 1848.

The following is a short account of what we know of the plant:—

It appears that it was first found in this country on the 3rd of August, 1842, by Dr. George Johnston, of Berwick-on-Tweed, in the lake of Dunse Castle, in Berwickshire. The lake is situated upon a tributary of the Whitadder River, which flows into the Tweed. Specimens were sent at the time to Mr. Babington; but the discovery was lost sight of, and the interest in it died away until the autumn of 1847, when it was again discovered, by Miss Kirby, of Lubbenham Lodge, in reservoirs adjoining the Foxton Locks, on the canal near

Market Harborough, in Leicestershire. The plants were all females, and were found in considerable abundance, growing "closely matted together." Miss Kirby had not observed it there before; and the reservoirs had been cleaned out two years previously.

Miss Kirby's re-discovery awakened the attention of botanists to the subject; and Mr. Babington published a description of the plant in the 'Annals of Natural History' for February, 1848. Dr. Johnston, the first discoverer, on reading Mr. Babington's account, at once recognized it as the plant he had found in the loch of Dunse Castle, and in the following autumn found the plant at two stations in the Whitadder River.

The same season, but later, it was found by Mr. James Mitchel, in Nottinghamshire, in the Lene (a tributary of the Trent), near Nottingham, "growing in great profusion for about a quarter of a mile in extent." In November of the same year it was found in Northamptonshire, in the Watford Locks, by Mr. Kirk, "very abundant." The Watford Locks are on the same line of canal as the Foxton Reservoirs. Mr. Kirk observed that, when water was drawn from either of the locks, the force of the current detached small sprigs of the *Anacharis*, which were carried into the body of the canal. Mr. Kirk considered it to be an introduced plant. His plants were also all female. Subsequently, Mr. Kirk changed his views, and regarded the plant (from its simultaneous discovery in so many other localities) as a true native. He also described it as growing in such dense masses that it was with difficulty good-sized specimens could be detached, owing to its extreme brittleness. Mr. Kirk was informed by the lock-man that the plant was quite as abundant when he first came to the locks, five years before, although the reservoirs had been cleaned out once or twice during that period. The lock-man further stated, that he had formerly resided at the Foxton Locks, and that the reservoirs there were "full of it more than twenty years back;" also that it had been plentiful in the Market-Harborough Canal during the whole of that period. A short time after this conversation took place, two labourers belonging to the locks came up; and both of them confirmed the statement of its being plentiful in the Market-Harborough Canal; and one of them added that the "Welford Branch," a narrow canal, comparatively little used, was so full of it that "the passage of boats was impeded, and the canal necessitated to be cleared out once or twice a year, and that it had been so for many years." I apprehend, however, there must be some mistake here.

In August, 1849, it was found in Derbyshire and Staffordshire, by

Mr. Edwin Brown, growing "in profusion," in the Trent, near Burton-on-Trent, and also in the canal there. Mr. Brown was convinced that the plant was new to that locality. He describes it as forming "very large submerged masses, of a striking appearance." All the flowers were females. At Christmas, 1850, it was found, by Mr. Kirk, in Warwickshire, near Rugby, "in the greatest abundance," and in July, 1851, by the same gentleman, in the Oxford Canal, near Wyken Colliery.

The Rev. W. M. Hind, writing from Burton-on-Trent, in July, 1851, describes the plant as occupying a much larger portion of the river than when first noticed, eighteen months before, and adds:—"In fact, it bids fair in a short time to block up one of the two streams into which the Trent here divides."

Last year (1851) the *Anacharis* was noticed by myself and others in the river between Ely and Cambridge, but not in great quantities. This year it has increased so much that the river may be said to be full of it; but I must defer a more particular account of its behaviour in the Cam and Ouse till my next letter, when I will dispose of the remaining questions, of whence it came, how it got here, and by what means it is to be got rid of.

Letter 3.

Having in my last traced this plant from its first discovery in Berwickshire, in 1842, down to its recent appearance in the Cam and Ouse, I propose to devote this letter to a particular account of its behaviour in our own rivers, believing the chief interest connected with it to lie in this direction.

I have already described the weed as growing in dense, submerged masses, distinguishable at once from all others by its "leaves growing in threes, round a slender, stringy stem;" and, although this brief description is amply sufficient to identify the troublesome pest, a short further account of its appearance and habits may not be uninteresting. The colour of the plant is a deep green; the leaves are about half an inch long by an eighth wide, egg-shaped at the point, and *beset with minute teeth, which cause them to cling*. The stems are very brittle, so that whenever the plant is disturbed fragments are broken off. Although at present it cannot propagate itself by seed, its powers of increase are prodigious, as every fragment is capable of becoming an independent plant, producing roots and stems, and extending itself indefinitely in every direction. Most of our water-plants require, in order to their increase, to be rooted in the bottom or sides of the river

or drain in which they are found ; but this is independent altogether of that condition, and *actually grows as it travels* slowly down the stream, *after being cut*. The specific gravity of it is so nearly that of water, that it is more disposed to sink than float ; and the cut masses may be seen under water, either on or near the bottom, rolling over and over like wool-packs, clinging to everything they meet with, and accumulating in great quantities at locks and bridges (hugging the piers of the latter), and grounding in shoal-water. Its mode of growth may be best seen in still and narrow waters (such as the stream above the mills at Cambridge), where it seems to spring, first from the two sides and bottom, meeting at length in the middle, and completely filling up the watercourse, as I have seen in some cases, almost to the exclusion of the water. Except in very quiet places, it is not likely to be found in flower. I have, however, found it flowering in great profusion just below Ely ; but, as the plant is diœcious (*i. e.*, producing male and female flowers on separate individuals), there is no fear, as I have before remarked, of its producing seeds in this country, all the specimens hitherto found being of one sex only.

Although there is little doubt that in 1850, and perhaps in 1849, it might have been detected in our rivers, if diligently sought for, it does not appear to have attracted the notice of watermen and the staff of fen officials, whose duty it is to cut the weeds in the summer time, till last year, when it was noticed, in considerable quantities, all the way from Small Bridges down to Bottisham Lock, but not to one-third its present extent. I have been informed, however, that even last year it was raked out of the river near Waterbeach and Ditton, and carted away for manure. At the present time it needs no longer to be sought for ; it may be found everywhere, in more or less quantity, from Cambridge downwards, choking up the mouths of docks, sluices, and narrow watercourses, and in the upper portions of the river impeding both navigation and drainage. Perhaps its wonderful and rapid increase this year may be owing to the excess of wet, and the long continuance of hot weather raising the temperature of the water to an unusual degree ; but, if it should continue to increase in anything like the same ratio as it has done, the upper parts of our rivers will no longer be able to pass their waters to sea, and the navigation interest may surrender to the railways what little remains to them of the carrying trade.

That it is already a source of annoyance to our watermen, is evident by the universal complaints which have been made of the obstructed state of the River Cam. I am told that the river at the backs of the

Colleges has been so blocked, that extra horses had to be yoked on before barges could be got up to Fosters' Mills.

Sluice-keepers also complain that masses of it get into the pen, and when the slackers are drawn the openings are choked, and the operation of letting boats through is greatly impeded.

The Railway Dock at Ely became so choked with the weed, that boats could not enter until several tons of it had been lifted out. At Roswell-hill Pits, below Ely, the entrance docking was so blocked that the gault-boats could not get in till it was removed. It was here where I found it in flower.

Rowers, too, find it interferes with their amusements; and swimmers remark that it clings to them like "scratch-weed," and that, if they are overtaken by a lump of it, they are likely to be entangled, and dragged by it into deep water.

Even the fishermen complain that they can no longer ply their nets so freely as they were wont; and I am informed, on good authority, that they have discontinued setting their hook-lines (*i. e.*, lines laid across the river with a series of hooks attached), because the "new weed" either carries them away bodily, or strips them, both of their baits and fish.

Lastly, the drainage is impeded. Mr. Human, sen., our experienced officer, informs me, that although the waters this season have been run off at Denver Sluice *a foot lower* than in previous years, the average height of the water in the river below Cambridge has been *a foot higher* than in ordinary seasons; and he refers at least half this difference to the obstructions occasioned by the presence of the Anacharis.

From these facts I apprehend your readers will by this time have arrived at the conclusion that a troublesome stranger has intruded himself among us, uninvited; but whence he came, how he got here, and by what means he is to be got rid of, will furnish ample materials for another letter.

Letter 4.

If you were some fine morning to find that a strange person, of foreign aspect, had intruded himself into your house, I imagine the questions which would most naturally occur to your mind under such circumstances would be,—Whence came the fellow, how did he get here, and how am I to get rid of him? But, as no one is presumed to know the faces of all his neighbours, you would wish, doubtless, before accosting him as a "rascally foreigner," to make sure he was

not some obscure inhabitant of one of the back streets of your own town. So, in the case of our present unwelcome visitor, before one can ask the question whence he came, we ought to be satisfied that he really *is* a stranger. Now, some botanists seem to think he has all along been a native of these islands, but has "made himself so scarce" as not to have been previously recognized by our Botanical Detective Force;* while others pronounce him an unmistakeable foreigner, greedy and rapacious, "fixin" himself in John Bull's rivers, for all the world as if he had as good a right to occupy them as the aborigines themselves. For my own part, I have no sort of doubt upon the subject; I hold, with the watermen, that he is a veritable "foreigner," although I find that the Rev. Mr. Bloxam, who had visited its place of growth, said, in 1848, he "could find no reason to doubt its being a true native;" and Mr. Kirk, who first regarded it as introduced, afterwards changed his views, and concluded it must be indigenous, "from its simultaneous appearance in so many localities." Whatever Mr. Bloxam's reasons were for his opinion, Mr. Babington appears to have agreed with him at that time. If, however, Mr. Bloxam thought so only because "numbers of other water-plants grew in the same locality," the reasoning is very unsatisfactory, seeing that any introduced water-plant must necessarily be found in company with other water-plants. The other argument, derived from its "simultaneous appearance in so many localities," loses much of its force when the numerous localities come to be reduced, as I shall hereafter show, to one, or at most two. I have already stated that the plant was first found in 1842, in the loch at Dunse Castle. Now, at first sight one would suppose a quiet lake in Scotland beyond the reach of sophistication; but Dr. Johnston informs me that aquatic plants had been introduced into that piece of water from the south. Here, then, we have evidence of the probability of the *Anacharis* being an introduced plant at Dunse. Then we learn that, six years after, it was found in the Whitadder, between the loch at Dunse and the sea; and now, in August, 1852, Dr. Johnston writes to me thus:—"As with you, so with us, the weed is altering the character of the Whitadder, and will require before long to be dealt with as we have dealt with savages in some places." Its second discovery was in the Foxton Locks, situate on the Union Canal, which connects Market Harborough with Leicester, and the

* The plant is so unlike any of our British water-plants that it could not possibly have been overlooked. There is but one plant, the *Potamogeton densus*, that could ever be mistaken for it, and this only by the most superficial observer.

River Welland with the Soar and (through the Soar) with the Trent. When, therefore, it was found in the Lene, near Nottingham, it should be remembered that it was in a part of the same water-system. Afterwards it was found in the locks at Welford and Watford, near Northampton; but these points are within a very short distance of each other, and both are on the same line of canal as the Foxton Reservoir. In 1849 it was found in the canal near Burton-on-Trent, and in the Trent River; but these points, although in two new counties, were all in water communication with the previous stations; and, again, when it was found in Warwickshire, near Rugby, and in the Oxford Canal, these are within ten or twelve miles of the Watford Station, and on the same line of canal. These several midland localities may therefore be regarded virtually as but one, because the *Anacharis*, when once introduced, would in a few years inoculate any connected water-system, from one end to the other.

Indeed, if any one will take the trouble to look at a good map of England, it will appear clear that there was hardly a spot so well-calculated as a centre from which to inoculate our English rivers, as Rugby or the Watford Locks, near the Crick Railway Station. From such a point, situate at an altitude above the sea of about 350 feet, and very nearly at the line of water-shed which divides England into the river-basins of the Severn on the west, the Trent on the north, the Ouse on the east, and the Thames on the south, a few detached sprigs, travelling different ways, would enter the Severn through the Avon *viâ* Rugby and Warwick; the Thames through the Cherwell at Banbury, and thence by Oxford; the Nene above Northampton; the Ouse at Buckingham; the Welland at Market Harborough; the Trent above Burton, by the Anker and Tame; and, again, lower down, at Nottingham, by the Soar; and from Nottingham the Witham could be reached by the Grantham Canal; and thence by Lincoln the drains of North Lincolnshire would be impregnated. And then, when the pest had travelled as far down (on the Trent, for example) as the top of the Humber, the numerous vessels ascending the great valley, of 4000 square miles, drained by the Yorkshire Ouse, would carry it up with them, and so inoculate that ample river and its numerous tributaries.

That the plant is only now descending these rivers is evident. It has appeared in the upper part of the Ouse, and for four years has been observed in the Nene; two years ago it appeared at Lincoln, but had not then reached the northern parts of that county; and in our own river, while it occupies the line of descent from Cambridge to

the sea, the "Old West" river and the "Lark" are as yet free of it, except just above their confluences. Looking at these facts, I would ask,—If it be a native, how is it that it has never exhibited its extraordinary powers of increase till now?—for, if it be not new, we must suppose that a new property has recently been imparted to it, which is absurd; and what better proof of its newness can be offered than by the facts made patent, that it is only now in the act of descending our rivers? To my mind the evidence is conclusive that it is a foreign importation; and it is not until we are satisfied on that point that we can properly discuss the question of, Whence came it?

Now, this is a point on which no *ex cathedrâ* dictum can at present be pronounced. The question can only be settled by a careful comparison of our plant with its congeners in other countries. It appears, however, that plants of the genus *Anacharis* are confined to the American Continent, and that one plant, called *Anacharis Nuttallii*, or *Udora Canadensis*, very closely resembling, if not identical with, ours, is found in the American rivers. Dr. Johnston has specimens from Dr. MacLagan, gathered in Detroit River, which exactly resemble his Berwickshire plant, save only a slight difference in the outline of the leaves.

The American plant is frequent in the rivers from Canada to Virginia. I think, therefore, we may safely answer the question of "whence it came," by saying "from North America."*

But then, How did it get here? Now, there are various ways in which a plant may be imported. A botanist, in the ardour of that botanical instinct which prompts him to surround himself with as many as possible of the beautiful and varied forms of vegetable life, might have introduced it; but we have no evidence that such has been the case, although botanists have been known to do such things. If one might hazard a conjecture, I should say that it was most likely introduced, at or about Rugby, with American timber, during the execution of some of the numerous railways which meet at that point. We know that in North America the timber is floated in rafts down the rivers, in which case fragments of the American weed would cling to it, or seeds might find their way into the clefts of the wood; and if but one seed or one fragment retained its vitality, in some moist cranny,

* I observe a correspondent of the 'Stamford Mercury,' signing himself "Caledoniensis," affirms that the plant is an importation from Norway; but, as it does not appear that it is found in Norway, or, indeed, anywhere on the Continent, I cannot subscribe to his assertion.

till it reached its final destination, I verily believe it would be sufficient to account for the myriads of individuals that now exist in England. Indeed, from the circumstance of all the plants hitherto found being of one sex, the hypothesis of its propagation from a single seed or fragment is rendered more probable than by supposing a number of seeds or fragments to have been imported.

But some one will be asking, as the plant could not have found its way by water from Rugby or Watford to Cambridge, How came it in the Cam? This question, through the kindness of Mr. Babington, I am enabled to answer distinctly. In 1847 a specimen from the Foxton Locks was planted in a tub, in the Cambridge Botanical Garden; and in 1848 the late Mr. Murray, the Curator, placed a piece of it in the conduit stream that passes by the new garden. In the following year, on Mr. Babington asking what had become of the stick which marked the site of the plant, he was informed that it had spread all over the ditch. From this point it doubtless escaped, by the waste pipe, across the Trumpington Road into the "Vicar's Brook," and thence into the river above the mills, where it is now found in the greatest profusion. In the case of the Cam, then, we see it proved to demonstration, that the short space of four years has been sufficient for one small piece of the *Anacharis* to multiply so as to impede both navigation and drainage. When Professor Gray, of Boston, U.S., was at Cambridge, Mr. Babington mentioned the circumstances to him, at which he expressed surprise, as the *Anacharis* is not found to spread in this active manner in America. Perhaps our sluggish streams, the decomposing vegetable and animal matters in our Cambridge waters, and especially the excess of lime present (fifteen to seventeen grains in the gallon), furnishing an inexhaustible supply of inorganic food, may account for its more rapid increase here than in America.

Lastly, with respect to the question, How is it to be got rid of? I think we may answer it at once, by an emphatic "*not at all.*" Like the imported European horses and oxen in the South-American pampas, or Capt. Cook's pigs in New Zealand, or the Norway rat in our own farm-yards, or the Oriental black-beetle in London kitchens, or (more remarkable still) like the exotic mollusk, *Dreissena polymorpha*, which has now spread itself through the canals of this country, we may conclude it has fairly established itself amongst us, never to be eradicated. All we shall be able to do is to try and keep it down; and in order to effect this it should not be left in the rivers after being cut, in the hope of its finding its way to sea, but be raked out at once

upon the shores; and Commissioners of Drainage should beware of letting fresh water into their districts, for the weed will inevitably enter with it, and blockade the ditches.

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Thirty-seventh Sitting.—Saturday, September 25, 1852.—MR. NEWMAN, President, in the chair.

The President read the following portions of a letter from Mr. Backhouse, of York, dated September 13, 1852 :—

Devonshire Variety of Lastrea Filix-mas.

“The plant noticed in Hooker & Arnott’s Flora as a variety of *Lastrea Filix-mas*, noticed in Devonshire, with a rachis scaly nearly throughout its length, and of a yellowish hue, is frequent in the mountain districts of this county, of Durham, and of at least some parts of Scotland. Its pinnules are nearly entire, truncate, or perhaps truncately obtuse, and slightly toothed at the apex. The paleæ are reddish brown, and the fronds, especially in their young state, of a yellowish green. At the High Force in Upper Teesdale, on both sides of the river; near St. John’s Chapel, Weardale, Durham; at the Bilberry Reservoir, Holm Moss (where it attains a height of four feet); near Huddersfield, Yorkshire; glens of the Clova mountains, particularly the ravine of the White Water, which is at the head of Glen Dole; I have especially noticed this plant, growing in many of them along with the common variety, and in the ravine of the White Water along with another variety, of the usual colour, but with the pinnules strongly serrated, and the lowermost strongly lobed.”

Abbreviated Form of Lastrea Filix-mas.

“The abbreviated variety of this plant is common on the basaltic cliffs of Teesdale.”

Pseudathyrium alpestre.

“After Thomas Westcombe, of Worcester, left us, we (*i. e.*, my son and myself, who were subsequently joined by G. S. Gibson) continued

to find *Pseudathyrium alpestre* in all the corries of the Dee-side mountains, and those of the neighbouring districts. It was often mixed with *Athyrium Filix-fœmina*, at an elevation of from 2000 to 3000 feet; but from 3000 to 4000 feet *A. Filix-fœmina* had ceased, and *P. alpestre* was plentiful. In damp gorges, and among tumbled rocks, it was often destitute of fructification; but in more open places it was abundantly in fructification, varying from six inches to three feet four inches in height. A remarkable variety, with deflexed pinnæ, was only met with in one place in Glen Prosen."

Gymnogramma leptophylla.

"I am not acquainted with *Gymnogramma leptophylla*; but, if it resemble any of the forms of *P. alpestre*, I should give the lady who thought she found the former at Braemar credit for having gathered it in the corrie of Loch-na-gar, or some such place, and confounded it with small *A. Filix-fœmina*, which grows in the place she has pointed out, along with *Cystopteris fragilis* and a few other commoner ferns. Careful investigation of her locality for it did not, however, turn up a single specimen of *Gymnogramma*. As localities of *Polypodium alpestre* the following may be given:—Can-lochen Glen, Glens Prosen, Dole, Phiadh, Callater, and Canndin, Ben-na-muich-dhui, Loch Aan, Cairn Toul, Ben-y-Glo, Loch-na-gar, and Dhu Loch."

Cystopteris Dickieana.

"When in Scotland, I visited the cave at Cove, near Aberdeen, in which *Cystopteris Dickieana* is found. It is a cave of considerable dimensions, into which the sea washes in high tides, and in gneiss? rock. The upper portion is rather wet, and much covered with *Marchantia*, from amongst which the *Cystopteris*, as well as *Asplenium marinum* and *Athyrium Filix-fœmina*, grow. The *Cystopteris* is generally without fructification, and in the cave the *Athyrium* is universally so, and requires great care to distinguish it. On a ledge outside, very difficult of access, the *Athyrium* is in fructification. As *Asplenium marinum* becomes sometimes divided when it recedes from the coast, as at Warrington, and the allied *Asplenium obtusatum* of the southern hemisphere becomes, in the interior of Norfolk Island, *A. diversifolium*, sometimes divided to filiform shreds, with the fructification marginal, because the narrowness of the segments allows no other place for it, may not *Cystopteris fragilis* on the coast, in a wet cave, have its fronds altered into *C. Dickieana*? If so, the latter is nevertheless a striking and beautiful form. I have it in cultivation, so may see if it change."

Pteris aquilina in a Smoky Locality.

The President next read the following note, from Mr. Lloyd :—

“ At Vauxhall, opposite to the railroad-station, is the course of an old stream; on the opposite side of the road, and between two houses, are a few yards of low, dead wall; looking over which, may be seen, growing upon the wall of the right-hand house, *Pteris aquilina*. It is growing in the middle of a tuft of *Linaria Cymbalaria*, is apparently a seedling of last year, and is in that beautifully delicate state which we so admire in plants of that age. The spot where it grows is quite inaccessible except with a boat at high water. Is not this the nearest *wild fern* to the City of London ? ”

Lilium Pyrenaicum, Gouan.

The President read the following observations, respecting the discovery of this plant in Devonshire, by Mr. George Maw, dated August 14, 1852 :—

“ Stem *furrowed*, three to five feet high; leaves *scattered*, lanceolate, with a narrow, finely fimbriated, membranous margin, upper surface trisulcate, with three corresponding ridges underneath; flowers one to seven, nodding, *yellow spotted with black*; perianth reflexed. Flowers about the end of June: in hedges near Mollond, North Devon.

“ About two years ago I recorded, in the ‘ Botanical Gazette,’ the occurrence of *Lilium Pyrenaicum* between South Molton and Mollond, North Devon; but at that time I had not had an opportunity of examining the spot, so as to enable me to offer an opinion as to the probability or not of its being a native. When I first noticed it (May, 1850) I was riding by, late in the evening, and had only time to hastily gather a few specimens, which were not then in flower. During the present month (September) I have re-visited the spot, and will endeavour to lay the result of its examination before your readers. I found the plant still growing in great profusion. When I originally observed the plant I only noticed it growing on the west side of the road; but during my late visit it was pointed out to me, in still greater abundance, on the field side of the eastern hedge. It extends on both sides for a distance of forty or fifty yards. It does not grow in a continuous patch, but is scattered about in tufts, many of which are very luxuriant, consisting of twenty or thirty stems each. The hedges appear to be very old, and are on the top of low banks which have been left in cutting the road. The fields adjoining the road are both of them nearly on a level with the top of the banks, only a small

portion of the latter having been formed artificially. The estate on which the plant grows is called Sheep-wash, and is about five miles from South Molton, and a mile and a half from Mollond, but not in the most direct road between the two places. After you leave the turnpike-road from South Molton to Wilvelescombe, you descend into the valley, and cross a stream; but, instead of turning to the left, the road to Twitching should be followed. The plant grows nearly at the top of the hill, just below where the road suddenly turns down into the Mollond valley. There is a farm-house at no very great distance from the spot; but I do not think it possible that the lily can have been introduced thence, as I cannot find any traces of the plant in the field or orchard intervening. Mr. Rew, the tenant, tells me it is not growing in his garden; and I do not think that it is cultivated anywhere in the neighbourhood. The plant has all the appearance of being truly wild, and I feel much inclined to look upon it as a native; at all events, it has equal claims with its congener, *L. Martagon*, to be considered as such. It must have taken a very long time to spread to its present limits, as it only increases by roots, and does not perfect seeds, or multiply by axillary bulbils, like some of the species. The inability to produce seed seems to militate against its being under the most natural circumstances; but many plants that are re-produced easily by their conservative organs are shy at perfecting seeds. It would be interesting to know whether or not the plant produces seed in a wild state in Southern Europe. I believe the most northerly stations that have been recorded for it are in Provence and the Pyrenean range.

“It must not be forgotten that the cultivation of the soil affects the distribution of plants in two ways: it not only tends to equalize the flora of different countries, by the transmission of seeds with imported grain, and by various other means; but, when the condition of soil and climate have been altered by cultivation, many plants will become *exterminated*. Every agriculturist knows what a change takes place in the plants of a meadow on its being properly drained, the Carices and rushes giving place to the grasses, which delight in a drier and warmer soil. Many of the rarer Orchises are becoming scarcer every year; and if a *perfect* system of arable culture were extended throughout this country, the number of our Orchideæ would grow “small by degrees and beautifully less,” till at last the whole family, with many other plants of similar habit, would become extinct. When we consider the large proportion of England that is under the dominion of the plough, we must not be surprised at plants like the lily being but

very sparingly distributed ; and I think it does not at all follow that a plant has been introduced because we only find it in one or two localities.

“In conclusion, may I express a hope, that should anybody pay a visit to the plant they will exercise towards it the conservative spirit of the true botanist, and not go with the eradicating hand of the mere plant-collector.”

Flora of Surrey.

The President referred to a communication he had received from Mr. Salmon, relative to two previous communications, published in the July number, critically commenting on the paper in the May number intituled ‘On the Division of the County of Surrey into Botanical Districts, with a view to the Preparation of a Flora of Surrey.’ Mr. Salmon thought that the prefatory notice which had been printed and circulated with the separate copies of the paper would fully meet the views of the objectors. This notice, dated February 6, 1852, is as follows :—

“About three years ago, a few friends, devoted to the pursuit of Natural History, resolved, at a meeting held for this purpose in the town of Guildford, to take steps for collecting and arranging the materials existing or procurable in order to compile a complete Flora of the county of Surrey. With this object the map of the county was divided into nine portions, representing as many districts, or divisions, with reference, as far as practicable, to the geological formations ; also blank forms were prepared, and transmitted to all who felt an interest in the subject, or who were willing to supply information.

“On reference to the accompanying map, it will be seen that the three northern districts, or divisions, from east to west, along and lying to the south of the river Thames, include the greater part of the London clay, one of the three primary groups of strata ; also that the three central divisions include the chalk, and the three southern the wealden, formation.

“In order to determine accurately the natural vegetation of each district, it was found necessary to define the various boundaries by limits more definite than the strata afford ; and rivers, canals, railroads, and highways were adopted as the interior lines of demarcation. Of course the river Thames is the northern boundary-line of the three northern districts ; and the counties of Kent, Sussex, Hampshire, and Berkshire form the external boundaries on the east, south, and west.

"Information was requested, in the blank forms distributed, on the following points :—1. The No. and name of the species, in accordance with the 'London Catalogue of British Plants.' 2. No. of district or division. 3. Locality. 4. Soil. 5. Habitat. 6. Aspect (if the plant grows on a slope, north, south, east, or west). 7. No. of stations in which observed. 8. Time of leafing. 9. Time of flowering. 10. Observations. From the various returns made, it has been found impracticable to obtain at present all the information required. With a view of supplying in some measure the deficiency, it is considered desirable again to solicit the co-operation of all botanists either resident in or connected with the county, and to furnish them with a detailed description of the divisions, accompanied by an illustrated map, and for the present to limit the information solicited to the mere name of the plant, and the name or number of the district in which it occurs, waiving the notice of soil, aspect, altitude, and times of leafing and flowering. It would be very desirable to ascertain the frequency or abundance of the species generally, by noting the extent which they occupy, *viz.*, by stating whether the plant is plentiful or otherwise over a large area, and, again, whether it be rare or plentiful in the few spots where it grows. But information of the presence or absence of a plant in any or all of the districts (so far as known to the contributor) will materially aid the promoters of this undertaking.

"The appended list of Ranunculaceous plants that have been ascertained, by personal inspection, up to the present time as occurring in the county, will show by the blank spaces in which divisions the species is absent.

"Any communication which may tend to promote the above-mentioned object will be received by Mr. J. D. Salmon, of 164 A, Strand, London; and all communications will be duly acknowledged."

The President read the following notes, from Mr. J. G. Baker, of Thirsk :—

Sisymbrium Austriacum.

"In a vasculum of plants procured for me during the earlier part of the current season, from the Durham coast, are several luxuriant specimens of this species. They were collected amongst the sand-hills on the north-east of Hartlepool, in the neighbourhood of a large quantity of clayey soil, brought thither, by a temporary line of railway, from the new docks; so that most likely the seeds have been originally introduced along with foreign ballast, and lain dormant till

their removal has offered a favourable opportunity for germination ; but it would be interesting for any botanist, who might be able to visit the locality, to ascertain if it occurs in small quantity or in abundance, and whether there is any probability of its becoming permanently naturalized in this country."

Anacharis Alsinastrum.

"I am afraid the *Anacharis* can hardly be considered even naturalized, much less 'truly indigenous,' in this county. In the only station yet recorded (*Phytol.* iv. 365), it grows at Kirby Wiske, in a pond immediately beneath the garden of the Rev. R. Pulleyne, and was planted there for ornament, about three years ago, in company with various other British and foreign aquatics, since which it has increased so rapidly as to fill up the pond with a dense mat-work of stems, which effectually prevent the growth of its less hardy neighbours ; so that it is no longer a desirable occupant, but bids defiance to all attempts to destroy it. In time of flood this pond communicates with the river Wiske ; so that the *Anacharis* will most likely become established along the course of the stream in process of time, and thence be conveyed to some of the numerous broad ditches that intersect the low meadows in the neighbourhood, which are all that remains of what was once Newsham Carr."

Serrafalcus patulus, Pail.

"This plant appears thoroughly established, in considerable abundance, along with *Apera Spica-venti* and *Lolium temulentum*, on the disused ballast-hills at the mouth of the Tees, on the Durham side of the river, some of which are now partially brought under cultivation ; it, however, seems entirely] absent from the deposits on the opposite (Yorkshire) bank, many of which are of more recent formation ; but its place is supplied by numerous other plants which are not of frequent occurrence in the North, amongst which are *Lepidium Draba* and *L. ruderale*, *Sinapis alba* and *S. nigra*, *Scirpus Tabernæmontani*, *Festuca pseudo-Myurus*, *Hordeum maritimum*, *Melilotus alba*, *Pastinaca sativa*, *Fœniculum vulgare*, &c."

Ranunculus confusus, Gr. & Godr.

"This plant is plentiful in the salt-water ditches that intersect Coat-ham marshes, and is subject to almost as many variations in habit and character as its intimate ally, *R. aquatilis*, from which it appears essentially distinguished by its slender, ovate-conic receptacle, and

its flat stigmas. The length of the stamens is very variable ; in the usual state they are longer than the receptacle ; but a variety (perhaps the *R. Randolii* of the 'Flore de France') is not unfrequent, in which the filaments are as short as in ordinary *R. aquatilis*, and the point of the fruit is less decidedly terminal than in the normal form. There is also a remarkably slender, much-branched variety, with all its parts only about a third the size they usually attain, and which is almost entirely destitute of the submersed capillary leaves. The species is not confined to water immediately within the influence of the sea, as it also grows in a pool amongst the sand-hills between Marske and Saltburn."

Lastrea glandulosa.

The President read the following note, also by Mr. Baker, dated September 6, 1852, but declined expressing any opinion on the subject:—

"I enclose a few scraps of a *Lastrea* not unfrequent in Yorkshire, which I have collected this season, in the neighbourhood of York, Thirsk, and Hawnley, which I presume to be identical with the plant described in the 'Phytologist' under the provisional name of *Lastrea glandulosa* ; but my own observations would induce a belief that it is not distinct as a species from *L. multiflora*, though remarkable, and worthy of attention, as a curious variety or variation. In fact, I have occasionally noticed fronds with their stipes so densely covered with glands as to deserve the name of mealy, and others with the stipes shining and polished,—typical *glandulosa* and typical *multiflora*,—with gradual intermediate gradations proceeding from the same root ; but usually, when any of the fronds from the root are mealy, the remainder are glandular in a greater or smaller degree ; and when any of the fronds from the root are decidedly eglandulose, the quantity of glands on the remainder is quite inconsiderable. The mealiness is not nearly so conspicuous in dried as in recent specimens. The enclosed is not nearly so mealy as some I have collected, and is selected merely from its size ; but, if your conclusions do not coincide with mine, I shall be happy to enclose a series in my parcel to the Botanical Society next month, though my most characteristic 'glandulosas' are mostly already distributed."

Celsia cretica in Ireland.

The President said that he had received the following communication, through the kindness of Dr. Balfour Baikie, of Haslar Hospital,

and remarked that it was a singular coincidence that the *Celsia cretica* and *Arbutus Unedo* occurred in company in the Mediterranean, both frequenting stony localities. It would be highly interesting could the former be established as a native of Ireland:—

“Mr. Alexander has found, in a barren pasture near Ballinacurrah, and at a distance from any garden, *Celsia cretica* growing with *Verbascum Thapsus*, in tolerable abundance.”

Lastrea uliginosa.

The President read the following note, from Mr. Westcombe, on this fern, dated Worcester, September 21, 1852:—

“I am still much puzzled with *Lastrea uliginosa*, for I cannot distinguish it from *L. spinosa*. I think that the barren fronds of *L. cristata* will be sufficient to keep it distinct from either of the others. I shall not be inclined to allow all three to be included in one species.”

Pseudathyrium alpestre.

The following remark on this fern is also from the pen of Mr. Westcombe:—

“*Pseudathyrium alpestre* appears to be restricted to the upper portions of the mountain glens of the Clova district, and of the Cairngorm range, as far as my observations go: but I did not travel northward of the latter; so that possibly it may be common in the north part of Scotland. After leaving Braemar I visited the Sow of Athol, and crossed the mountains to Loch Rannoch, thence to Glencoe, and returned by Tyndrum to Loch Dochart, searching the mountains north of that for *Cystopteris montana*, but in vain. I did not observe the *P. alpestre* in passing through that part of the country, though I kept on the look-out for it.”

Asplenium germanicum in Cumberland.

The President begged to acknowledge the receipt of a specimen of *Asplenium germanicum* from Miss Wright, of Keswick. It was accompanied by the following note, dated Sept. 21, 1852:—

“I take the liberty of enclosing a frond of *Asplenium germanicum*, which I have found, while looking for *A. septentrionale*, on high rocks in Borrowdale; and within a quarter of a mile I also found *A. septentrionale*, *A. Ruta-muraria*, *A. viride*, *A. Trichomanes*, *Cystea dentata*, and very small specimens of *Polypodium Phegopteris*.”

Trichomanes speciosum in the County Limerick.

Mr. Moore, of Glasnevin, announced, in a note to the President, that the most recently detected habitat of this fern was near the "Keeper Mountain, in the county Limerick, where it was discovered by Mr. Pollock, of Oatlands, in the county Meath," but that the locality was now nearly destroyed. This extirpation was rapidly going on in the other habitats of this rare fern.

Polypodium Dryopteris in Ireland.

The President said that, notwithstanding the zeal and assiduity of Irish botanists, not a single instance had occurred of this fern being seen wild in Ireland since the single example found by Mr. Moore on Knocklayd, as recorded in the 'British Ferns.' He had lately corresponded with Mr. Moore on this subject, who confirmed the statement and circumstance, and considered the almost total absence of this fern from the Irish Flora a remarkable fact in the geographical distribution of ferns.

Naias flexilis at Roundstone, in Ireland.

The President thought it would be interesting to state that Dr. Melville, of Galway College, had re-discovered *Naias flexilis* at Roundstone, in fine fruit. Although somewhat of a repetition, Mr. Baker having already recorded this locality, he thought the fact of a second botanist observing it was worth this passing notice.

Dianthus deltoides in Worcestershire.

The President observed that this might rather be regarded a re-discovery. Mrs. Bennett Williams informed him that she gathered the plant last week at Cookley, near Kidderminster, and that it had also re-appeared at Blackstone Rock, near Bewdly, where it was recorded as growing very many years ago. Concerning this station Mr. Westcombe writes, under date September 21, 1852:—"Although I have sought for *Dianthus deltoides* for a great many years at Blackstone Rock, I never could find it till this year, when, happening to be in flower, it was conspicuous among the grass."

Poterium muricatum and Filago apiculata.

The President announced that Mr. Westcombe had added these two species to the Flora of Worcestershire this summer.

Osmunda regalis near Kidderminster.

The President exhibited a specimen of *Osmunda regalis* gathered last week at Lower Broadwater Forges, near Kidderminster. It is an extremely rare plant in this vicinity ; and no botanist had previously found it in the locality indicated.

Correction of a previous Error.

Mr. M'Ennes wished to correct an error in his paper, which had caused inquiry at the last meeting. *Veronica palustris* should be *Viola palustris*. (See Phytol. iv. 693).

Polypodium Phegopteris in the Forest near Balcombe.

The President had received three communications recording the finding of *P. Phegopteris* in the Forest near Balcombe, all the communicants having been induced to visit the locality in consequence of reading the paper by Messrs. Lloyd and M'Ennes (Phytol. iv. 633).

Dianthus cæsius on St. Vincent's Rocks.

The President read the following communication on this subject, from Mr. Flower, of Seend, under date September 24, 1852 :—

“ Having observed in the August number of this journal (Phytol. iv. 649) that a patch of *Dianthus cæsius* had been discovered growing on St. Vincent's Rocks, I take the earliest opportunity of recording the fact that it has been introduced into the neighbourhood, and can have no claim whatever to be considered indigenous in the above locality. In 1841 I observed a patch of this plant ‘in the road leading to the Giant's Hall.’ Here I know it to have been planted ; also in several spots in the neighbourhood of the Serpentine Walk, and on the walls of the cloisters in College Green, where I have seen a plant occasionally. I may also add, that scarcely a season passes but the seeds are brought from Cheddar, and scattered in the vicinity of the rocks, but with little or no success, as this exceedingly rare plant does not appear to maintain its ground long together in any of its new localities.”

Lastrea recurva in the Isle of Mull.

The President exhibited a specimen of *Lastrea recurva*, recently gathered by Mr. Tanner, of Bristol, near Tobermory, in the Isle of Mull. This discovery greatly extends the northern range of the species.

Lastrea rigida in Ireland.

The President exhibited a specimen of *Lastrea rigida* which had been kindly transmitted to him by Mr. C. L. Darby, of Thomastown, accompanied by the following information :—

“I gathered this fern early in the present month (September), in the county Louth, at Townley Hall, the residence of Mr. Balfour. It was growing on a wall built of clay-slate, and much overhung with trees. I saw about thirty plants of it; and the following ferns were also growing in company :—*Ceterach officinarum*, *Asplenium Rutamuraria*, *A. Trichomanes*, *Athyrium Filix-fœmina*, *Lastrea Filix-mas*, and *Scolopendrium vulgare*. This is an interesting extension of geographical range.”

Drawings of British Plants.

The President exhibited a volume of drawings of British plants, executed in the most beautiful manner. The volume was only one of nine, which he was desirous of disposing of; and he would be happy to show it to any botanist who might call for that purpose, or correspond with any one disposed to purchase. He considered it impossible for the drawings to be surpassed in beauty or accuracy; and the collection was almost perfect. The drawings were arranged according to the natural system; and in the volume now on the table, and extending to the *Caryophyllaceæ*, *Helianthemum Breweri* of Planchon was the only species omitted.

Spiranthes cernua in Ireland.

The President read the following note, from Mr. D. Moore, of Glasnevin :—

“I have not heard that *Spiranthes cernua* has been seen in its Irish habitat for several years. The last information was from Dr. Armstrong, who told me the ground where it grew had been ploughed up and sown with oats. *Sic transit, &c.*”

The President also made a *vivâ voce* communication on *Uredo Frumenti*, the fungus-blight of wheat (see p. 700).

A List of the Fungi detected in Cloyne and its Vicinity, in 1852.

By W. T. ALEXANDER, Esq., Surgeon R.N.

March.

Agaricus, Linn. (*Collybia*, Fries), *androsaceus*. Dead bramble-leaves.

Polyporus versicolor. Tree-stumps.

Acrosporum compressum. Dead herbaceous stems.

Sclerotium durum. Dead herbaceous leaves.

„ *Pteridis*. Dead *Pteris aquilina*.

Xylaria Hypoxylon. Dead stumps.

Stromatosphæria decorticata. Dead apple-branches &c.

„ *deusta*. Ash-stump.

Cucurbitaria coccinea. Dead branches.

„ *elongata*. Furze-branches.

Cryptosphæria Hederæ. Dry ivy-leaves.

„ *millepunctata*. Dead ash.

„ *subconfluens*. Dead oak-leaves.

„ *Taxi*. Dead yew-leaves.

„ *Strobilina*. Dead fir-cones.

„ *Lauri*. Dead laurel-leaves.

„ *bifrons*. Dead holly-leaves.

„ *herbarum*. Dead herbaceous stems.

„ *punctiformis*. Dead oak-leaves.

Sphæria spermoides. Rotten wood.

„ *Peziza*. Dead dry wood.

„ *tuberculosa*. Bark of trees.

Lophium elatum. Pine-bark.

„ *mytilinum*. Pine-bark and cones.

Hysterium Rubi. Bramble-stems.

„ *foliicolum*. Ivy-leaves.

„ *Pinastri*. Dead fir-leaves.

„ *Fraxini*. Dead ash.

„ *gramineum*. Dead grass-leaves.

Xyloma acerinum. Sycamore-leaves.

Scleroderma Cepa. Oak-trunks, Castlemartyr.

Bovista nigrescens. Pastures.

Craterium leucocephalum. Dead beech-leaves.

Stilbum vulgare. Dead thistle-stem.

Trichoderma viride. Stumps &c. (at first snow-white).

Uredo Senecionis. On stems and leaves of *Senecio vulgaris*.

„ *Potentillæ*. On *Fragaria sterilis*.

„ *Æcidiiformis*. On *Smyrnium Olusatrum*.

Æcidium confertum. On *Ficaria* leaves.

Puccinia Rubi. Under bramble-leaves from the preceding autumn.

April.

Lachnea stercorea. Cow-dung.

„ *bicolor*. Larch-twigs.

Dacrymyces stellatus. Dead wood.

Cryptosphæria Lonicæræ. Honeysuckle-branches.

„ *acuta*. Dead nettle-stems.

„ *semi-immersa*. Dead honeysuckle-stems.

Hysterium lineare. Dead wood.

Dematium articulatum. Dead wood.

Uredo linearis. On grass-leaves.

„ *candida*. On *Capsella Bursa-pastoris*.

Clitocybe giganteus. Wood. (Frequent in autumn).

Stromatosphæria multiceps. Dead apple-wood.

Lycoperdon excipuliforme. Pine-wood. (Frequent in autumn).

Ascophora Mucedo. Putrid Swedish turnip.

Favolus (*Polyporus*) *squamosus*. Old beech-trunk.

Microporus (*Polyporus*) *igniarius*. Tree-stumps.

Penicillium glaucum. On damp card.

Thelephora intybacea. Old trunks.

Uredo Helioscopiæ. On *Euphorbia* leaves.

„ *Ruborum*. Under bramble-leaves. (Common in autumn).

Puccinia tumida. On *Bunium Bulbocastanum*.

Stromatosphæria corniculata. Dead branches.

„ *disciformis*. Dead hazel-branches.

„ *nigro-annulata*. Dead, dry branches (ivy).

Cladosporium herbarum. Dead herbaceous stems.

Diderma globosum. On dead beech-leaves.

Stictis radiata. Dead stems and wood.

Polysticta (*Polyporus*) *Carmichaelianus*. Decayed trunk, Castle-martyr.

Tubercularia confluens. Dead sycamore-branches.

Stemonitis fasciculata. Rotten stump.

Cribraria micropus. Dead fir-stems (and on a decaying cabbage-stump, September).

Stromatosphæria undulata. Dead elder-wood.

Cryptosphæria acuminata. Dead thistle-stems.

„ *faginea*. Dead beech-branch.

Thelephora epidermea. Dead branches.

„ *calcea*. Decayed wood.

„ *incrustans*. Spreading over moss, earth, and trunks of trees.

Rhytisma corrugatum. Crusts of lichens (*Parmelia*).

Fistulina hepatica. Old ash-trunk.

Uredo effusa. Under *Spiræa Ulmaria* leaves.

Sphæria hirsuta. Dead stems.

Coprinus congregatus. About the roots of trees.

Æcidium Grossulariæ. Under gooseberry-leaves.

Tremella intumescens. On earth.

„ *albida*. Fallen branch.

Puccinia variabilis. On *Leontodon*-leaves.

May.

Exidia Auricula-Judæ. Elder-trunks towards the sea.

Æcidium Periclymeni. Under woodbine-leaves.

„ *Tussilaginis*. Under colt's-foot-leaves.

Puccinia Umbelliferum. Under *Smyrnum Olusatrum* leaves.

Uredo suaveolens. Under *Cnicus arvensis* leaves.

„ *Rosæ*. On the leaves of wild rose.

„ *Sonchi*. Under *Sonchus oleraceus* leaves.

„ *Labiatarum*. On mint-leaves (*Mentha arvensis*).

„ *Rumicum*. On dock-leaves.

„ *Cichoracearum*. On *Hypochæris radicata* leaves.

„ *gyrosa*. On raspberry-leaves.

„ *Heraclei*. *Sphondylium*-leaves (chiefly the under side).

„ *bifrons*. Both sides of sorrel-leaves.

„ *Vitellinæ*. Under the leaves and on the female catkins of *Vitellina*.

„ *Rhinanthacearum*. Under the leaves and on the petioles of *Scrophularia nodosa*.

„ *Lini*, Linn. Both sides of the leaf of *Linum catharticum*.

Agaricus, Linn. (*Psilocybe*, Fries) *ericæus*. Grassy places.

„ Linn. (*Dermocybe*, Fries) *cinnamomeus*. Woods, fields, hedge-banks, &c.

Thelephora corium. Dead trunks of trees.

- Thelephora fraxinea*. Dead ash-branches.
Hydnum auriscalpium. On fallen pine-leaves.
Microporus (*Polyporus*) *variegatus*. On stumps of trees.
 „ „ *abietinus*. On fir-stumps.
 „ „ *incarnatus*. Dead pine-trunks.
Cryptosphaeria arundinacea. On dead reed and rush stems.
Penicillium sparsum. On decaying Fungi.
Cenangium ferruginosum. On dead fir-branches.
Stromatosphaeria fusca. Dead hazel-branches.
 „ *lata*. Dead branches.
Erineum pyrinum. Under crab-tree leaves.
 „ *acerinum*. Under sycamore-leaves.
Phialea (*Peziza*) *chrysocoma*. On posts.
 „ „ *fructigena*. Dead hazel-wood.
 „ „ *pedicellata*. On rotten sticks.
 „ „ *cinerea*. Dead sticks in woods.
 „ „ *herbarum*. Dead herbaceous stems (turning black in age).
Aleuria (*Peziza*) *humosa*. On earth among moss.
Lachnea (*Peziza*) *virginea*. On rotten bramble-stems.
 „ „ *hirta*. On earth and heathy ground.
Tremella mesenterica. On fallen branches.
Clavaria uncialis. On fallen beech-husks.
Mucor stercorea. On dung.
Cylindrosporium concentricum. On cabbage-leaves.
Acrosporium fasciculatum. Rotten orange.
Aspergillus glaucus. On damp card.
Boletus luteus. Woods. (Frequent in autumn).
Sporotrichum tenuissimum. On decaying Fungi, fallen acorns, &c.

June.

- Ozonium auricomum*. Rotting stump.
Lachnea (*Peziza*) *papillaris*. Dead stump.
Sphaeria pulvis-pyrius. With the last.
 „ *stercoraria*. On old cow-dung.
Phialea (*Peziza*) *conigena*. Pine-cones (excessively minute).
 „ *vulgaris*, var. β . *diaphana*. Rotten twigs.
 „ *claro-flava*. Dead currant-branch.
Agaricus, Linn. (*Amanita*, Pers.) *asper*. Open woods.
 „ (*Dermocybe*, Fries) *testaceus*. Plantations.
 „ (*Mycena*, Pers.) *spinipes*. On fallen pine-cones.

Agaricus, Linn. (*Psalliota*, Fries) *campestris*. Common mushroom. In one specimen, diameter of cap 9 inches, circumference of stem $6\frac{1}{2}$ inches. Some years abundant in this neighbourhood; this year rare.

„ (*Clitocybe*, Fries) *ovinus*. Pastures. In those overhanging the sea-side, where flocks of sheep are fed, it occurs in long lines and dense patches.

„ *baccatus*. On earth in woods, general.

„ (*Lepiota*, Pers.) *clypeolarius*. Outskirts of woods, not common.

„ (*Pleurotus*, Fries) *nidulans*. Old crab-tree trunk.

Puccinia Violæ. Under *Viola canina* leaves.

Uredo Tussilaginis. Under colt's-foot-leaves.

„ *oblongata*. Under *Luzula*-leaves.

„ *flosculosum*. On *Scabiosa arvensis* florets.

„ *segetum*. Within grains of corn.

Æcidium Pini. On *Pinus sylvestris* leaves.

„ *Taraxaci*. Under *Leontodon*-leaves.

Actinothyrium graminis. Dead grass-culms.

Aleuria (*Peziza*) *granulata*. On cow-dung.

Pilobolus crystallinus. With the last.

Xyloma concavum. Holly-leaves.

„ *populinum*. On aspen-leaves.

July.

Agaricus (*Mycena*, Pers.) *galericulata*. Pine-stumps.

„ (*Coprinarius*, Fries) *disseminatus*. Trunks of trees.

„ *semiovatus*. On cow-dung.

„ (*Mycena*, Pers.) *vulgaris*. Dead bramble-stems and dead fir-leaves.

„ (*Collybia*, Fries) *Rotula*. In woods.

„ (*Galera*, Fries) *tener*. Grassy places.

„ (*Mycena*, Pers.) *pellucidus*. On dead leaves.

„ (*Coprinarius*, Fries) *papyraceus*. Roots of oak-trees.

„ (*Russula*, Pers.) *emeticus*. Woods.

„ (*Russula*, Pers.) *ruber*. Dry fir-wood.

Lycoperdon bovista. Pastures.

Æcidium cornutum. Under mountain-ash leaves.

Coprinus niveus. On horse-dung.

„ *radiatus*. On cow-dung.

Ascobolus furfuraceus. Old cow-dung.

- Dothidea typhina*. Live stems of grass.
Erineum griseum. Under oak-leaves.
Uredo Polygonorum. Under Polygonum Aviculare-leaves.
 „ *Campanulæ*. Under Campanula Trachelium leaves.
Clitopilus phlebophorus. Decayed wood.
Boletus luridus. Wood, with the last.
Cryptosphæria Ægopodii. Under living leaves of Heracleum
 Sphondylium.
Puccinia globosa. On bean-leaves.

August.

- Uredo farinosa*. Under Salix Caprea leaves.
 „ *ovata*. Under Populus tremula leaves.
 „ *Populina*. Under Populus nigra leaves.
 „ *Primulæ*. Under primrose-leaves.
Omphalia ericetorum. Among grass.
Puccinia Centaureæ. On Centaurea nigra leaves.
 „ *Circææ*. Under Circæa Lutetiana leaves.
 „ *Polygoni*. Under Polygonum amphibium leaves.
 „ *Potentillæ*. Under Fragaria sterilis leaves.
 „ *gracilis*. Under raspberry-leaves.
Cryptosphæria duplex. On Sparganium leaves and stems.
Agaricus (*Mycena*, Pers.) *epipterygius*. On elm-trunks among
Gymnostomum viridissimum.
 „ (*Psalliota*, Fries) *semiglobatus*. Meadows.
 „ (*Pleurotus*, Fries) *variabilis*. With the last.
 „ (*Galarhæus*, Fries) *controversus*. Woods.
 „ (*Clitocybe*, Fries) *coccineus*. Among grass.
 „ (*Collybia*, Fries) *ramealis*. Dry branches.
 „ (*Galarhæus*, Fries) *scrobiculatus*. Woods.
 „ (*Omphalia*, Pers.) *fibula*. Among moss.
 „ (*Galera*, Fries) *hypnorum*. Among moss.
Mitrula Abietis. Dead branch.
Boletus subtomentosus. Woods.
 „ *esculentus*. Damp woods, Rostellan.
Thelephora rubiginosa. Old oaks, Rostellan.
 „ *caryophyllæa*. On fir-stumps, and on the ground, in
 fir-woods.
Hysterium pulicare. Rugged oak-bark, Rostellan.
 „ *angustatum*. Dead wood.
Phialea (*Peziza*) *inflexa*. Rotten sticks.

Rubigo Alnea. Under live alder-leaves.

Dictydium cernuum. Old pine-stump.

Xyloma salignum. On *Salix Caprea* leaves.

Nolanea pascua. Pastures, &c., &c.

Pistillaria quisquiliaris. Among moss.

Erineum aureum. Under *Populus nigra* leaves.

Coprinus plicatilis. Woods.

Microporus (Polyporus) spongiosus. Dead dry branches.

September.

Lachnea plano-umbilicata. Decayed nettle-stems.

Septaria Ulmi. Elm-leaves.

Sphæronæma subulatum. On the hymenium of decaying *Microporus igniarius*.

Uredo Fabæ. On bean-leaves.

Agaricus (Collybia, Fries) perforans. On fallen pine-cones.

„ *sulphureus*. Woods, common.

„ *puniceus*. Among grass, and in woods.

„ (*Pholiota*) *squarrosus*. Roots of trees.

„ (*Amanita*, Pers.) *rubescens*. Woods and heathy places.

„ „ *vaginatus*. Wood at Rostellan.

„ (*Clitocybe*) *ceraceus*. Among grass.

„ (*Galarhæus*) *plumbeus*. Damp woods.

„ (*Dermocybe*, Fries) *sanguineus*. Woods.

„ (*Leptonia*, Fries) *chalybeus*. Among grass.

„ (*Lepiota*, Pers.) *procerus*. Woods. At Rostellan, gigantic.

„ (*Mycena*) *purus*. Woods.

„ (*Dermocybe*, Fries) *helvolus*. Woods, fields, &c., &c.

„ (*Flammula*, Fries) *inopus*. Trunks of trees (rooting).

„ (*Clitocybe*) *fusipes*. Woods.

„ (*Involoma*, Fries) *varius*. Woods, &c., &c.

„ (*Inocybe*, Fries) *scaber*. Woods.

„ *geophyllus*. Woods.

„ *rimosus*. Damp woods.

„ (*Armillaria*, Fries) *melleus*. Wood at Rostellan.

„ (*Collybia*, Fries) *tuberosus*. On the roots of *Agaricus* (*Clitocybe*) *sulphureus*.

Exidia glandulosa. Dead stump among moss, Rostellan.

Clavaria coralloides. On the ground, wood at Rostellan.

„ *fragilis*. Damp places in woods. (Yellow and pure white).

Clavaria vermicularis. Among grass ; grove at Rostellan.

Microporus (Polyporus) frondosus. Among grass ; grove at Rostellan.

„ „ *giganteus*. Ash-trunk.

„ „ *perennis*. Wood. (Stem central).

Spumaria alba. Dead herbaceous stems.

Puccinia Epilobii. Under *Epilobium palustre* leaves.

Lycoperdon pyriforme. About tree-stumps.

Cantharellus lutescens. In a damp wood.

„ *undulatus*. Woods.

W. T. ALEXANDER.

September, 1852.

Notes from North Wales, in August, 1852.

By ALFRED SHIPLEY and R. REYNOLDS, Esqs.

BELIEVING that the number of botanists more or less acquainted with the Flora of North Wales is considerable, and that pleasing reminiscences in connexion with it must occur to all such, we have thought that the memoranda of a few days' tour last autumn may prove of some slight interest. We make no pretensions to discovery, simply hoping to convey to former explorers some news of old friends, as recently observed *in situ*. And here we must acknowledge our obligations to the interesting papers upon the botany of the district, published in the 'Phytologist' about three years since, by the Messrs. Bennett and Mr. Lees (Phytol. iii. 709, 771, 869). The above papers formed our botanical guides throughout the journey.

Reaching Chester one day about the middle of August, *Diplotaxis tenuifolia* from the city walls was our first captive. We proceeded by rail to Colwyn, the station immediately before Conway, and then, shouldering our knapsacks, struck off seawards, to the Little Ormeshead. We noticed *Chlora perfoliata* in profusion in the cuttings of the railway. At the back of the promontory, *Rubia peregrina*, *Geranium sanguineum*, *Silene maritima*, *Inula Conyza*, *Veronica spicata*, with its beautiful racemes of flowers, &c. On the sands leading to Llandudno, *Eryngium maritimum*, *Glaucium luteum*, *Hyoscyamus niger*, *Senecio viscosus*, *Rosa spinosissima*, *Arenaria peploides*, or rather *Honckenya*, as the 'London Catalogue' not very euphoniously names the new genus. Llandudno grows as if it had something fungoid in its nature ; but accommodation has not yet outrun the possible

demand for it. After securing quarters at the only hotel where any beds were vacant, we heard about a score of tourists refused admittance, and sent back to Conway, which happened to be the place whence they came, to get lodgings for the night. Fennel and wormwood still flourish, and will probably retreat before, rather than capitulate to, advancing civilization. As may well be supposed, there was one botanical object uppermost in our thoughts—the *Cotoneaster vulgaris*. This is one of the plants whose value the 'London Catalogue,' second edition, expresses by an arithmetical notation peculiar to itself, as being $\frac{1}{20}$, a fraction which would most assuredly have puzzled Cocker, and may have been invented by some wag, to indicate the inestimable worth of the few species to which it is applied. Mr. Lees' graphic description of the locality led us to it at once. There is no lack of the plant; but we could only find three specimens in fruit, each having a single scarlet pome. The lower leaves were beginning to assume the same colour. Upon the same ledges of rock were *Silene nutans*, *Veronica spicata* (frequent), *Thalictrum minus*, and *Linosyris vulgaris* (not yet in flower). Higher up was *Epipactis ovalis*, *Bab.*, having a scorched and weather-beaten appearance. *Juniperus communis*, in the same station, has assumed a perfectly recumbent habit, clinging to the stony slopes as if conscious of its bleak position.

The walk along the shore to Conway gave *Convolvulus Soldanella* (in fruit, and abundantly) and *Salsola Kali*. The calm sea and bright sunshine tempted us to extemporize a bath, which, in consequence of a rising tide, and a beach of too easy gradients, was well nigh attended with the loss of our habiliments and baggage.

Diverging eastward, to Castell Diganwy, we found *Cotyledon Umbilicus*, *Silene nutans* (abundantly), *Smyrnum Olusatrum*, and *Sedum Telephium*. Mr. Pamplin, who was in North Wales but a few days previously, suggests that *β. purpureum* should be added to the name of the last-mentioned. Its mountain home has certainly infused a far deeper hue into its petals than is met with in tamer situations. The slopes of the adjacent hill to the north of Bryn Gosol yielded *Dianthus deltoides* sparingly, also *Sedum Anglicum*, a plant we frequently met with afterwards. Upon the ivy of Conway Castle, growing chiefly outside the walls, but also occurring within their bounds, we found *Orobanche Hederæ*, *Duby*. We noticed the largest quantity of this plant upon a partially ivy-clad bank under the west walls of the Castle, and just before the archway under which the road to the river passes. Its connexion with the roots of the ivy was certainly unequivocal in many instances. To this locality must be added Castell

Diganwy, where we had previously gathered it sparingly from the ivy on the west cliff. The character of the anthers of *O. Hederæ*,—ovate, prolonged, acute, conspicuously awned, even to the unassisted eye,—appears to us to be sufficient at once to distinguish it from *O. minor*, whether compared in a fresh state or as dried specimens. On the road from Carnarvon to Llanberis, *Cotyledon Umbilicus* presents itself the whole way, and is still found at greater distances eastward.

Just before the village of Cwm-y-glo, at the entrance to the Pass of Llanberis, the road intersects a bog of considerable area. A cursory examination of a small corner on the right-hand side of the road gave us *Hypericum elodes* (abundantly), *Scutellaria minor*, *Menyanthes trifoliata*, *Drosera rotundifolia*, *Myrica Gale*, *Rhynchospora alba*, *Narthecium ossifragum*, &c. Just beyond the village, the queenly *Nymphaea alba* was in full flower, in the ditches filled by the drainings of the bog. Here we also noticed *Comarum palustre*, and believe the locality would amply repay a diligent investigation. *Alisma natans* was in flower in Llyn Padarn, on the south side, near the Dolbadern Castle end. *Lobelia Dortmanna* was coming into fruit. We noticed it also in the following lakes, *viz.*:—Gwynant, Ogwen, Idwall, and Mymbyr. To these, Mr. Pamplin adds Llyn-y-cwm.

The ascent of Snowdon from Llanberis, making a détour to the foot of Clogwyn-dur-Arddu, gave *Arabis petræa*, *Oxyria reniformis*, *Rhodiola rosea*, *Saxifraga stellaris*, and *Empetrum nigrum*, in fruit. *Hypericum Androsæmum* and *Serratula tinctoria* have stations about a mile on the road from Beddgelert to Pen-y-gwryd. About half a mile from the latter place is a patch of *Anagallis tenella*, growing on a wet bank which overlooks the wall; (also along streamlets on either side of Y Glyder Fawr, Mr. Pamplin). The little way-side inn constituting Pen-y-gwryd is well worth the attention of the botanist, from its situation, which gives immediate access to either side of the pass. There is no pretension about the place; but those who may put up there, will find a hearty disposition to make them comfortable. It was here that we had the only opportunity, during our trip, of drying our “Bentall” before a fire.

Leaving Pen-y-gwryd in the morning, we steered our course due north, for Glyder Fawr, the ascent of which is about equal to that of Snowdon in time and labour. Not a single plant did it yield us. The prospect from the summit of the ridge, however, amply repaid the ascent, and would have done so had it simply included the black waters of Llyn Idwall at our feet, with the valley of Nant Francon beyond, leading the eye as far as Bangor and Anglesea. After going

a short distance to the west, we descended into Cwm Idwall, a task not without some risk, as the rocks here are very precipitous. We afterwards ascertained that we should have proceeded along the ridge, nearly as far as Twll Du, before descending. On the east side of Cwm Idwall, which forms a sort of platform above the lake, were *Silene acaulis* (in tolerable plenty), *Thalictrum alpinum*, *Parnassia palustris*, and several of the Snowdon plants.

We have said nothing of the ferns, although often gratified by the luxuriant beauty of the commoner and semi-rare kinds. We were not fortunate enough to come across *Woodsia*, *Asplenium septentrionale*, or *Polystichum Lonchitis*. Our explorations were generally arranged so as to accord with a constant *progress* on our route. Can any one give an account of the rarer ferns of the district during the past season?

A. SHIPLEY, R. REYNOLDS.

October, 1852.

On the Fertility of certain Hybrids.

By T. BELL SALTER, Esq., M.D., F.L.S.*

HAVING, some time since, performed some experiments on certain plants, the results of which brought before me some facts at variance with the opinion commonly received regarding the laws of hybrids, I am induced to state them, very shortly, accompanied with a few remarks upon them.

I would wish, first, to state the now usually received opinions respecting the laws according to which the intermixture of species, and the subsequent perpetuation of the resulting progeny, appear to take place. I cannot better do so than in the words of Professor Carpenter. "The conclusion which has now been attained," writes that accomplished author, "is equally applicable to both the animal and vegetable kingdoms." "In plants the stigma of the flower of one species may be fertilized with the pollen of an allied species; and from the seeds produced, plants of an intermediate character may be raised. But these *hybrid* plants will not perpetuate the race; for although they may ripen their seed for one or two generations, they will not continue to reproduce themselves beyond the third or fourth. But if the intervention of one of the parent species be used, its stigma

* Read before the Isle of Wight Philosophical Society.

being fertilized by the pollen of the hybrid, or *vice versâ*, a mixed race may be kept up for some time longer; but it will then have a manifest tendency to return to the form of the parent whose intervention has been employed." "Amongst animals the limits of hybridity are more narrow, since the hybrid is totally unable to continue its race with one of its own kind; and although it may be fertile with one of its parent species, the progeny will of course be nearer in character to the pure blood, and the race will ultimately merge into it." "One or two instances have been mentioned, in which a mule has, from union with a similar animal, produced offspring; but this is certainly the extreme limit, since no one has ever maintained that the race can be continued further than one generation, without admixture with one of the parent species."* So writes Professor Carpenter, one of the most satisfactory authors that could be cited as setting forth the received opinions on the best and most recent authorities.

As regards that part of the opinion which has reference to the animal kingdom, I am enabled to state a very interesting case in point, observed by my relative, Professor Bell. A few years since, he kept specimens of both sexes of the common domestic goose and the swan-goose (*Cygnus Guineensis*). They readily bred together; and a race of hybrids was the result. He watched very closely, to observe whether the hybrids would breed among themselves. This was never the case in any one instance, though both male and female hybrids bred readily with the other sex of both the pure breeds; the resulting progeny of course more nearly approximating to the pure species than did the first hybrids. This, therefore, is entirely confirmatory of the received laws of hybrids, as set forth above in the words of Dr. Carpenter. Not so, however, were two instances which have occurred to myself in reference to plants.

Ten years ago I instituted some experiments, not with any reference to testing the opinions on the laws of hybridization, but to ascertain the value of certain forms of British plants as species. The plants in question appear in our Floras as species; but I had a suspicion they were hybrids. The plants are *Epilobium roseum* and *Geum intermedium*. The former I suspected, in common with an opinion at one time held by the late Sir James Edward Smith, to be a hybrid between *Epilobium montanum* and *E. tetragonum*,† though

* 'Principles of Physiology, General and Comparative,' by W. B. Carpenter, M.D., F.R.S., &c., 3rd edit. p. 983.

† Eng. Bot. vol. x. tab. 693, 1800. Sir James Smith here writes, speaking of *Epilobium roseum*:—"Is it possible to have arisen from seeds of the latter" (*E.*

he afterwards abandoned that idea;* and the latter plant,—*Geum intermedium*,—I believed, in common with many botanists, to be a hybrid between *Geum rivale* and *G. urbanum*.†

And first with regard to the *Epilobium*. Seeds were easily obtained by fertilizing the stigma of *Epilobium tetragonum* with the pollen of *E. montanum*; and the hybrid plants produced were intermediate, in all their characters, between the parent species. They were not, however, identical with *Epilobium roseum*, as I had suspected they might be, but distinguished from it by a *slightly* four-notched stigma, and a habit rather more like *E. tetragonum*. So far, therefore, as regards the first object of my experiment, I had an answer in the negative.‡

However, having now a new race of hybrids, I was anxious to observe the behaviour of these plants as regards the permanence of their form and characters. I saved seeds from the original hybrids, and sowed them. The second race was undistinguishable from the first. The seeds of these I again saved and sowed, and still no difference could be detected; and so on to four turns, when, being satisfied of the reproductive powers of these hybrids, and the permanence of the form, I discontinued the experiment. To this day, however, hybrids of the same characters with the original ones continue to come up in my garden.

I may further state that the original hybrid plants were all of them almost exactly alike, one or two only out of a very large number having a slightly stronger resemblance to one of the parent plants. So with the subsequent generation: they remained like each other, and like the first race, with an occasional slight exception, as at the first.

The hybrid *Geums* were formed by fertilizing the stigmas of *Geum rivale* by the pollen of *G. urbanum*. This experiment was performed

tetragonum) “impregnated by the pollen of *montanum*? If so, it unites the external form of the father with the fructification or internal structure of the mother, according to the Linnæan hypothesis, as completely as could be wished.”

* Eng. Fl. vol. ii. p. 215, 1828.

† Smith's Eng. Fl. vol. ii. p. 431; Hook. Brit. Fl. 3rd edit. p. 256, 1835; Hook. & Arnott, Brit. Fl. p. 118, 1850.

‡ These hybrid plants I designated, in my herbarium, *Epilobium montano-tetragonum*. I afterwards reversed the experiment, by fertilizing *E. montanum* with pollen of *E. tetragonum*; and the progeny from this crossing I called *E. tetragono-montanum*. Not the slightest difference could be detected between the two races, thus obtained, in support of the Linnæan hypothesis above referred to, in the note quoted from Eng. Bot. t. 693.

also ten years ago. The result obtained was a set of plants intermediate in characters between the parent forms, and perfectly identical with the wild plant, the *Geum intermedium* of Ehrhart, such as I have myself found growing in Scotland, when botanizing, some years since, in the neighbourhood of Edinburgh, in company with my friend, our Vice-President, Dr. Martin.*

The result as respecting forms was in this case precisely the same as with the *Epilobiums*; *i. e.*, the vast majority of plants were precisely like each other, with the exception that one or two were slightly more like one of the pure parents;† and so also with the subsequent generations: they remained like each other, and like the first hybrids; and to this day the same form continues to propagate itself, by seed, in my garden.

We have, then, in this latter case, not only an instance of two species considerably different being capable of forming permanent and fertile hybrids, but also the proof of such actually existing in the wild state!

My late very dear friend, our lamented Vice-President, Dr. Bromfield, was of opinion that the British Flora presented two other instances of natural and fertile hybrids, *viz.*, a plant referred by Babington to *Linaria italica*, *Trev.*, and *Scrophularia Ehrharti*, *Stev.* The former he supposed to be a hybrid between *Linaria repens* and *L. vulgaris*, and the latter between *Scrophularia nodosa* and *S. aquatica*. I do not take it upon myself to deny that they may be hybrids, as inferred by Dr. Bromfield; but it is rather remarkable, that in many attempts which I made at his request, during several successive summers, to make hybrids between the species just named, all my efforts to do so utterly failed, the plants in none of the numerous instances I tried producing seed; while with the *Epilobium* and *Geum* I succeeded in the very first instance. Dr. Bromfield, I believe, finally gave up the

* As a memorandum of the origin of my hybrids, I have named them, in my herbarium, *Geum urbano-rivale*. The reverse experiment I never made, owing to the *Geum urbanum* not blooming in my garden until too late to obtain pollen from *G. rivale*.

† The same slight variation occurs also in the wild plants of Britain, and may be considered as confirmatory of their like origin. The like differences also appear to exist in the German plants, as we find Reichenbach naming as two distinct species plants which more nearly resemble either *Geum rivale* or *G. urbanum*,—their parent plants, as I believe; designating as *Geum urbano-rivale* the commoner form, which is the *G. intermedium* of Ehrhart, and that referred to in the text above; and the other form, which is more like to *G. urbanum*, as *G. rivali-urbanum*.—Reich. Fl. Germ. Excursoria, vol. ii. p. 598.

idea of *Scrophularia Ehrharti* being a hybrid plant, as no reference to this view is made in his Notes on the plants of Hampshire ;* but he ever retained the belief that such was the case with the plant called by Mr. Babington, *Linaria italica*.†

The opinion I have deduced from the fertility of the seeds of my hybrid *Geum* and *Epilobium* I feel to be important, because the fact of fertility is generally deduced as proof that the parent forms are only varieties, and not distinct species. I will quote the words of Professor Carpenter on this subject, as they occur in connexion with the remarks I have already quoted from his elaborate work on General and Comparative Physiology. After speaking of the non-fertility of hybrids from different species, the author writes :—"Where, on the other hand, the parents were themselves only varieties, the hybrid is only another variety, and its powers of reproduction are rather increased than diminished ;—so that it may continue to propagate its own race, or may be used for the production of other varieties *ad infinitum*. In this way many beautiful varieties of garden flowers have been obtained, especially among such species as have a natural tendency to change their aspect." "There are many instances in which foreign plants that have been introduced into this country under different specific names, have been found capable of producing fertile hybrids ; in these cases a more accurate examination of the original locality has generally shown, that the parents were nothing more than permanent varieties, or even hybrids naturally occurring between other varieties. This is particularly the case with many of the South American genera, such as that elegant garden flower the *Calceolaria* ; and this is probably the explanation of the almost indefinite number of splendid varieties, well known to horticulturists, which may be obtained from the South American *Amaryllis*."‡ The general rule thus expressed by Dr. Carpenter with regard to the facility of hybridizing varieties, and the fertility of the resulting forms, is certainly most true ; but, with respect to the opposing remarks,—that the fertility of the hybrids in *Calceolaria* and *Amaryllis*, and other garden plants, is solely from the identity, as species, of the different forms of the parent plants,—it appears to me the writer is only begging the question he is attempting to elucidate, a mode of writing, it is due to say, very unusual with this close-reasoning author. The instances thus cited by Dr. Carpenter are at least unsatisfactory ; and another garden-plant, —the *Fuchsia*,—would, I think, warrant quite the contrary conclusion.

* Phytol. iii. 628.

† *Ibid.* 625.

‡ Carpenter's 'Principles of Physiology,' 3rd edit. p. 983.

The instances, however, just cited of my own experiments on the *Epilobiums* and *Geums*, are free from all points of doubt as to their specific identity or distinctness, as no naturalist has, I believe, been yet met with, or will be found, who will contend that *Epilobium montanum* and *E. tetragonum* are only varieties of one species, or that *Geum rivale* and *G. urbanum* are not, as species, perfectly distinct one from the other.

T. BELL SALTER.

October, 1852.

Notes of a Few Days' Visit to Lynmouth, Devonshire.

By THOMAS CLARK, Esq.

DURING a few days' visit to Lynmouth, on the north coast of Devonshire, in the last week of July, I observed the following plants in rambling about the neighbourhood. Should any other reader of the 'Phytologist' pay a similar visit, a knowledge of their localities may add somewhat to the interest of the place, surrounded though he would be with subalpine scenery of rare beauty; steep, lofty hills, purple with heath-blossom; deep, wooded glens; and streams of the clearest water, rushing down among huge stones and rocks;—scenery unequalled, I believe, in the West of England, and rarely equalled anywhere.

Euphorbia hiberna. Along the northern border of the East Lyn, and in Brendon Wood, rather plentiful.

Meconopsis Cambrica. On the borders of the East Lyn and West Lyn; occasionally on little rocky islets in the streams.

Erodium maritimum. Southern border of the East Lyn, not plentiful.

Sedum rupestre. Borders of the East Lyn and West Lyn, not unfrequent, but generally in small quantities; also on rocky banks in the neighbourhood, and on the sea-beach at Lee Abbey, almost close to high-water mark.

Sedum Telephium. Countesbury Wood, Brendon Wood, and in the wood at Lee Abbey.

Sedum anglicum. Plentiful everywhere. This stonecrop is plentiful almost everywhere along the coast-line, from a little westward of Stowey, in Somersetshire, on to Linton, and no doubt still further west. Some years ago it grew, together with *S. rupestre*, on the summit of the Castle Rock in the Valley of Rocks, where most probably

both still grow. It was out of blossom, except in shady places. In very shady and damp places the blossoms were quite white, and the cymes and the leaves were much attenuated; in which state it had so much the appearance of *S. album*, that at first sight it might be mistaken for that species.

Campanula Trachelium. Brendon Wood.

Wahlenbergia hederacea. In springy places on the borders of the East Lyn and West Lyn.

Rubus Idæus. Brendon Wood, plentiful.

Orobus tuberosus. Brendon Wood. Different specimens, varying in the form of the leaflets, from linear to spear-shaped and oval.

Vaccinium Myrtillus. Brendon Wood.

Epilobium montanum. Road-side near the Waters-meet. Several specimens with clear white blossoms.

Hypericum humifusum. Frequent on stony banks along the road from Lynmouth to the Waters-meet, and still more plentiful on the sides of walls on the high ground between the Waters-meet and Linton.

Hypericum Androsæmum. On the border of the West Lyn, and in the wood at Lee Abbey.

Luzula sylvatica. Very fine in Countesbury Wood, three feet high, or more.

Taxus baccata. Lee Abbey, broad bushes flattened close against the face of the sea-cliffs.

Crithmum maritimum. Lee Abbey, on the rocks of the sea-coast.

Serratula tinctoria. Lee Abbey, on the sea-cliffs.

Asperula odorata. Lee Abbey, in the wood.

Malva moschata. Lee Abbey.

Asplenium marinum. In fissures and crevices of the sea-rocks at the Valley of Rocks, and at Lee Abbey.

Lastrea Oreopteris. On the borders of the West Lyn (very fine and plentiful), and in Brendon Wood.

No doubt other plants of more than common interest might be found in this beautiful place, so varied as it is in soil, altitude, and aspect. *Melittis Melissophyllum*, I know, grows here, though I did not find it; and there appeared to be three or four different species of *Hieracium*, though I cannot be certain of more than *H. sylvaticum*, the others not being in blossom. It is not improbable that *Empetrum nigrum* may be found somewhere on the neighbouring hills, as I have lately received it from the Quantock Hills; and I understand it has been lately found elsewhere in the West of England. Nor is it

in plants alone that the naturalist would find here much to interest him: there is an ample field for the geologist, the conchologist, and the entomologist. A large fritillary butterfly, or probably more than one species, was frequently seen by my companions and myself; and on the rough, stony beach at the mouth of the Lyn, we collected several species of sea-weed, with a few of the smaller zoophytes and corallines, and more than thirty species of shells.

THOMAS CLARK.

Halesleigh, October 7, 1852.

MS. Notes and Additions in a Copy of Ray's 'Catalogus Plantarum Angliæ,' &c. Communicated by WILLIAM PAMPLIN, Esq.

As whatever relates to a favourite pursuit, how apparently trifling soever, possesses a certain degree of interest in the mind of the pursuer, I shall make no apology for the following lines, of small importance though they be. As in the course of my business I often meet with such things, if this be approved, possibly other similar notes may be supplied from time to time, as they happen to occur, or come in my way.

WILLIAM PAMPLIN.

45, Frith Street, Soho, London,
September 29, 1852.

The following MS. notes and additions occur in a copy of Ray's 'Catalogus Plantarum Angliæ et Insularum adjacentium,' &c., the first edition, 1670, now before me; but I am quite unable to trace out the writer, evidently a contemporary of Ray's. The notes are partly slips inserted in the volume, and partly marginal: they are written in an exceedingly plain and neat hand.

Plants from Rich. Kaise of Bristoll.

(Direct to R. Kaise living in Lewins meade neer ye signe of ye Gunn).

1. Polypodium foliis dissectis. found in a wood neer Dennis powis in Clamorganshire.

2. Polypodium hellebori albi folio caule purpurascente. neer Mendip by Binnagar, 9 miles from Bristoll.

3. pusilla planta Peucedani facie.

4. Limonium majus.

5. *Limonium minus*.
6. *Nasturtium siliquosum folio sinuato*. on the Rocks between St. Vincents Rock and Cooks folly.
7. *Nasturtium petraeum*. on St. Vincents Rock and neer to Gorams chaire in Henbury, 3 miles from Bristoll.
8. *Thlaspi veronicae folio*. near Clack Mill not farr from Gorams chaire, on ye rocks.
9. *Eryngium marinum*.
10. *Cochlearia Britanica*.
11. *Gramen marinum spicatum*.
12. *Leucojum marinum sinuato-folio*.

Pæonia mas vera. found in Stankham wood, about halfe a mile from Winscham in Glocestershire, by Frans. Collins, who took up many of the roots and sold them to the Apothecaries of London, and left some of the small roots to grow againe, and sowed of the seeds he then gathered in the same place.

Oct. 29. 1678. from Tho. Lawson.

Filix mas ramosa pinulis dentatis.

„ *palustris s. aquatica*.

„ *mas non ramos. pinulis angust. raris profunde dentatis*.

„ *mas non ramos. pinulis latis auriculatis spinosis*.

• *Filicula montana florida perelegans*.

Chamæcistus foliis utriusque argent.

Rosmarinum sylvestre.

Thlaspi foliis globulariae.

Cyperus longus inodorus?

Calceolus Mariæ.

Asarum Asarabacca. this is reported to growe in ye marshes in Cardigan and in Pembroke shires by John Owen.

Alnus nigra baccifera. with the common Alders by Colemans moor nigh Reding.

Bursa pastoris minor, *Park*. The lesser Shepherds Purse. in the corne neer the hedge on the South side of the greate pond at Colemans moor.

Hypericum elegantissimum non ramosum folio lato, *J. B.* In ye pits about the middle of Early field and in ye land on ye right hand of Lodden Bridge, 3 miles from Reding.

Lysimachia galericulata minor. In Colemans and other Moors about Reding.

Œnanthe cicutæ facie Lobelii, Park. near Loddon Bridge by Colemans Moore.

Orobanche verbasculi odore. In Stoken Church Woods on the left hand of the the highway.

Pyrola Ger. In Sherbourne Wood on the right hand of Stoken Church hill.

Caryophyllus sylvestris 9 sive *pumilio alpinus Clusii.* found on Snowdon hill by Mr. E. Lloyd.

P.S.—Near the end of the volume is the following note, in a somewhat different hand, apparently of more recent date, *viz.*:—

“The mark is a pencil stroke before the plant——475 gathered.”

Extracts from the ‘Report on Substances Used as Food,’ exhibited at the Crystal Palace, in 1851. Reported by J. D. HOOKER, M.D., F.R.S., &c.

COMMON EUROPEAN CEREALIA.

OF the cerealia, commonly cultivated in Europe, *viz.*, wheat, barley, oats, and rye, the Jurors have examined about 500 samples, many of great excellence. These are exhibited in various qualities, and with different objects; some are ears on spikes, for scientific illustration; some, mere specimens, in boxes or bottles, forming important portions of the series of vegetable products that various countries have contributed; and, lastly, there are sacks and barrels of different grain from England, the colonies, and exporting countries in general.

These are unequally distributed, and afford no general information as to the relations between the countries and their produce, nor much as to the importance of their cultivation in the various parts of the world exhibiting them.

Thus, of oats, rye, and barley, which are the staple crops of northern and mountainous Europe and Asia, but very few samples are in the exhibition; comparatively speaking, wheat is very insufficiently represented from the United States; better, from our cold and temperate colonies; indifferently from England, Scotland, and Ireland;

and hardly at all from the continent of Northern India, where it is a most important winter crop.

There are three collections which appear prominently interesting in this division, and require a particular notice; they are those of Messrs. Lawson, Mr. Maund, and Mr. H. Raynbird.

Messrs. Lawson's collection exhibits the ear, grain, &c., &c., of every variety of cereal, and also models of all the roots which it has been found practicable to cultivate in Scotland; the specimens are beautiful, and the arrangement scientific and excellent. No consideration of cost or trouble has been allowed to interfere with providing all that is necessary to render this collection a true and complete illustration of the vegetable products of Scotland. A Council Medal has been awarded to Messrs. Lawson "for their admirably-displayed, very complete, instructive, and scientifically-arranged collection of the alimentary products of Scotland."

Mr. B. Maund's and Mr. H. Raynbird's collection of hybrid cerealia are of great interest from the importance of the process in other departments of the vegetable kingdom, and the known difficulty of hybridizing the cerealia in particular. This arises from the pains required to extract unexpanded anthers from one parent, and to replace them with the pollen of another; preventing at the same time the stigmas to be fertilized from receiving any other pollen than that artificially applied, and guarding them afterwards from the attacks of birds, and a variety of disturbing operations. The result appears, in most cases, to be an offspring stronger than either parent. Cone wheat has been principally experimented with by Mr. Maund, and it contains much gluten, but its extended culture has been discontinued by farmers, owing to a preference for wheats from which a whiter bread may be made. Mr. Maund's object is, by crossing this cone wheat to obtain an offspring equally productive, but with more starch in the grain. A Prize Medal has been awarded for the series exhibited. Mr. H. Raynbird exhibits a similar series, for which a Prize Medal is also awarded. This gentleman commenced his experiments in 1846, with two wheats of very opposite character, the "Hopetoun," a white wheat of long ear and straw, and fine grain, and the "Piper's thick-set," a coarse red wheat, with thick clustered ear and stiff straw, very productive, but apt to mildew. A few shrivelled ears were first produced. These were planted, and the young plants divided. The produce was copious of all intermediate varieties, some so very like their parents as to be rejected. Picked grains being

selected, abundant crops of both white and red hybrids were produced, partaking of the best qualities of both parents.

There are no wheats exhibited superior to the South Australian. This is probably owing to climate; for it appears, after a careful examination of many samples from the best wheat-growing climates, that Spain, and certain districts of southern Russia, produce hard wheats, equalling the Australian; whilst the produce of England, of the South of France, of the United States and Canada, hardly fall short of the same high standard. Large allowances have, in many cases, to be made for faulty agriculture, carelessly collected or insufficient samples, and for inefficient methods of threshing, &c., the grain. Such circumstances affect the adjudication of awards, but not perhaps the original value of the crop from which the samples were collected.

British Department.—But few malts are exhibited: the samples shown by Taylor and Son receive Honourable Mention. A sample of porter malt prepared by a “patent process” was exhibited by S. R. Poole, in which the “torrefaction or roasting” was not carried so far as in the ordinary brown malts, and which is said to contain in consequence a larger proportion of unchanged saccharine matter.

British East India.—Wheat has from time immemorial been a staple crop in the plains of northern India, and especially in the Punjab; and since the establishment of the studs at Buxar, Ghazepore, &c., oats have been extensively cultivated. Both are winter (cold weather) crops. The climate and soil are well fitted for these cereals, but owing to defects and carelessness in the agriculture and harvesting, the crops, though excellent, fall short of what most corn-growing countries produce. Further, owing to foul boats and granaries, and to the moist heat of the months immediately succeeding harvest, the wheat reaches England in a state too dirty and weavelled for market. There are two samples in the Exhibition, one of hard and one of soft wheat, of which the former is most prized by natives of India, probably for no better cause than that the hardness of the grain more closely resembles their favourite food, rice. Barley is most extensively cultivated in the Himalayah and Tibet, replacing in many districts the wheat, and producing an admirable flour; both are desiderata (as are the oats), which is much to be regretted.

Australasia.—From this quarter of the globe, including Van Diemen's Land and New Zealand, there are splendid samples of wheat, some of barley, and a few of oats. Port Adelaide stands pre-eminent for wheat and barley. Prize Medals have been awarded both to R. Hallett and Sons, and to Heath and Burrow, for wheat, which may be

considered perfect as regards growth, equality of grain, colour, weight, and quality. Swan River Colony and Port Phillip also send good wheats, but Van Diemen's Land appears to rank next to Port Adelaide, though much that was apparently excellent from the former was spoiled during the voyage. From Van Diemen's Land fine white wheats are exhibited by Messrs. Deane, Dray, and Deane, and also by Messrs. M'Pherson and Francis, to whom Prize Medals are awarded; the malt also of E. Tooth, Bagdad, is considered worthy of Honourable Mention. New Zealand is represented by wheat, barley, and malt, all of good character. The barley exhibited by Hugh Martin and by Thomas Renwick, and the malt exhibited by Hooper and Co., severally receive Honourable Mention.

Russia.—The collection of Russian cerealia is the finest in the Exhibition, forming a most attractive and prominent display. It consists of fine sheaves of the grains in ear, as cut, and abundant samples of the seeds in bowls; all well arranged and catalogued. Count Koucheleff has sent the greatest variety, and a Prize Medal has been awarded to his collection in general, in which the black wheat and naked barley, &c., are worthy of particular notice and Honourable Mention. Hard white wheat, from Odessa, exhibited by Colonel Shabelsky, has been awarded a Prize Medal. This wheat yields a very large crop, and is never grown on manured land, which is considered prejudicial to it. A fine sample of wheat from the Government of Saratoff, exhibited by Baguer, has been awarded a Prize Medal. Black wheat, a very valuable cereal, cultivated chiefly by the Cossacks of the Azof Sea: these samples are from the estates of Petroffskaja, and Nova Spasskaja, and are awarded a Prize Medal.

Turkey.—A large series of considerable merit illustrates the agriculture of this country. It is composed of samples of grain, in bottles, too scanty for accurate examination; and many are dirty and carelessly collected. Nevertheless as a collection it is well worthy of attention, and one of the samples, a hard wheat, has been awarded a Prize Medal.

Egypt.—This country grows more millets than corn, but both are copiously illustrated. One sample of white wheat, exhibited by H. H. Abbas Pasha, is of admirable quality; it is very large in the grain, and soft, and has been awarded a Prize Medal. The barley is good.

CEREALIA RARELY CULTIVATED IN EUROPE.

Rice, maize, and the Coix lachryma (Job's tears) are the chief products that appear to come under this head—millets, &c., being placed

in a separate sub-class. As an article of import, rice holds a very prominent place. Maize, on the other hand, has not found much favour in Great Britain, its flour, however cheaply imported, having never perhaps been sufficiently appreciated.

British East Indies.—Copious samples of about 50 Indian *rices* are exhibited by the Honourable East India Company, and to them a Prize Medal is awarded. Many are of good quality, but more are dirty, small, broken in the grain, and unequal; characteristic of the slovenly state of the Indian bazaars. The quality of many appears only after boiling. In size, colour, and fineness of grain, none are at all comparable to the Carolina and northern Italy *rices*: several are however very curious, especially the Mountain *rices*, grown without irrigation, at elevations of 3,000 to 6,000 feet on the Himalayah, where the dampness of the summer months compensates for the want of artificial moisture. The small reddish Assamese *rices* which become gelatinous in boiling, and the large, flat-grained, soft, purple-black “Ketana” rice of Java and Malacca are also very curious. The East Indian *maizes* are inferior in quality, and deteriorated. Borneo exhibits a large series of *rices*, some of them curious.

France.—The cultivation of rice in Europe is quite confined to the Southern States, and chiefly to the borders of the Mediterranean, where it is extensively grown, and is of good quality. Two varieties are exhibited from Bordeaux, by A. Fery, to whom a Prize Medal is awarded. One is a beautiful soft, brittle-bearded rice, irrigated, and called “Nostrana,” the other unirrigated, is bearded, harder, grayer and larger in the grain, and is called “Chinese rice.” Algeria contributes rice and maize of indifferent quality.

Spain.—The sample of rice from Valencia is equally good with that of Bordeaux, and swells much in boiling; it has been awarded a Prize Medal. Some good maize is exhibited, as also a sample of the seeds of *Cenchrus spicatus*, a cereal little known in Northern Europe, and of no great value.

Russia.—Much rice, and of good quality, is cultivated in the southern provinces of this empire. Two samples are exhibited, one unirrigated, from the mountainous districts of the Caucasus; the other in the state of paddy (unhusked), from Odessa. Of the latter, one specimen called Chaltik, from Khalil Beck, exhibited by Zilfoogar Beck Iskander Beck Ogli, is worthy of Honourable Mention.

Egypt.—Rice abundant, and of good quality; that cultivated in the Delta of the Nile, at Rosetta, is considered the best; the grain is broad, short, flat, and peculiarly striated.

United States of America.—The American rice, though originally imported from the old world, is now much the finest in quality. The Carolina sample of E. T. Heriot is magnificent in size, colour, and cleanness, and has been awarded a Prize Medal. A beautiful sheaf of beardless rice is also exhibited. Maize is a more important crop in North America than in any other civilized country, being used most extensively for stock feeding ; as flour for cooking ; and in various forms at table, green, as well as ripe ; toasted, boiled, or baked. The collections from America are very fine, particularly that of B. B. Kirtland, who exhibits 34 varieties, amongst which are to be found samples of nearly all those usually cultivated in the United States. A Prize Medal has been awarded to him.

MILLET AND OTHER SMALL GRAINS USED AS FOOD.

Under this head, besides millets, the Jury have considered buck-wheats : neither are well represented in the Exhibition, though of great importance in many parts of the world.

Buck-wheat belongs to the temperate and arctic climates, and is cultivated in Northern Europe, Asia, and America, and most abundantly in Central Asia and the Himalayah ; in the latter country the different varieties are grown at various elevations, between 4,000 and 12,000 feet. The finest samples exhibited are from Canada, by E. Trenholme : they are deserving of especial notice, and Honourable Mention. The United States, Russia, and Belgium, also exhibit small samples of good qualities.

Millets, again, are tropical or sub-tropical crops ; in India they hold a second rank to rice alone, and in Egypt, perhaps, surpass all other crops in importance. In West Africa they are the staff of life. The Egyptian samples are the finest ; and those numbered 90, 91, and 92, exhibited by H.H. Ilham Pasha, are deserving of Honourable Mention : they belong to *Holcus sorghum* and *H. saccharatum*, and are known to Europeans as “ petit mais.”

From *India* various samples are shown of the different species of *Panicum*, but not labelled in the manner such an instructive collection should be.

Ceylon exhibits millet of fair quality.

The red and white millets of *Austria*, *Russia*, and the *United States* are beautiful, particularly the Russian samples, exhibited by Lieut.-Gen. Ershoff, of *Panicum Italicum* and *miliaceum*, to which a Prize Medal is awarded.

Turkey abounds in small grains, and exhibits a large variety of them ; but the samples are insufficient and dirty.

PULSES AND CATTLE FOOD.

Under this head the Jury have included all leguminous seeds, whether cultivated as food for man or cattle.

The importance of peas and beans is well appreciated, both by the horticulturists and agriculturists in Europe, and our temperate colonies, where, however, they are comparatively of less importance, than the smaller pulses and grains are in various tropical countries,—such as haricots in the Brazils and West Indies,—ground or earth-nuts in South America, and especially in Western Africa,—beans of various kinds amongst the miners of Peru,—gram (*Ervum lens*) and dhal (*Cajanus*), with innumerable varieties of beans and small lentils, among the natives of India and Egypt,—and the Carob bean or St. John's bread (*Ceratonia siliqua*) in the Mediterranean countries. The above are all more or less copiously represented in the Exhibition by the countries named.

In the British Department, Lawson's great collection stands pre-eminent for extent and scientific value ; and there is also a large one of agricultural produce from Messrs. Gibbs. H.R.H. Prince Albert's "Augusta horse-beans," are magnificent, and have been awarded a Prize Medal as part of the collection of agricultural produce alluded to under the British Department of European cerealia. W. P. Croughton's golden pod beans are worthy of Honourable Mention. Raynbird's tick beans and those of Strange are good ; as are also Fordham's prolific peas.

Canada sends peas, beans, and haricots, all of excellent descriptions ; and no less remarkable for quality and colour than for cheapness. The blue imperial peas sent by D. Jones would command the highest price in any English market ; they have been awarded a Prize Medal, and a like award is given to D. Limoges, for his fine sample of white peas.

Belgium, Spain, Portugal, Turkey, Tunis, and Egypt, exhibit each, beans, peas, haricots, pulses, and legumes of all descriptions, but none except the Egyptian beans are worthy of especial notice.

Russia, besides many of these, exhibits green sugar-peas (dried unripe) ; those exhibited by Khokholkoff and Gregorjeff are worthy of Honourable Mention for their excellent flavour and sweetness.

(To be continued.)

Three Days' Walk in the New Forest, together with a few additional Localities to Dr. Bromfield's Hampshire Flora. By EDWARD T. BENNETT, Esq.

THE result of a short botanical excursion, undertaken a fortnight since, which has been tolerably successful in the plants we expected to find, though not presenting any important discoveries, may be worth recording in a note or two respecting them.

The magnificent forest scenery, enlivened by the graceful forms of the deer, bounding away on the approach of the stranger, alternating with boggy hollows, and wild and dreary tracts, covered with fern and gorse, affords an ever-varying landscape, and constitutes the principal feature of this unique part of the country. We entered the vicinity of the New Forest from Salisbury, having visited Stonehenge, carrying away no botanical remembrances except *Spiræa Filipendula*, still in full bloom, and abundant, though so much after the period assigned it in the books. A rubbish-heap by the road-side near Salisbury produced *Mercurialis annua*, and the hitherto scarce *Medicago denticulata*, readily distinguished by its beautiful and peculiar fruit. From Salisbury, down the rich and fertile valley of the Avon, to Christchurch, is a charming road, commanding, at times, beautiful peeps of water scenery, especially between Fordingbridge and Ringwood. *Calamintha officinalis* and *Salvia verbenaca* profusely ornament the road-sides and banks in many places; and in a turnip-field the bright blue blossoms of *Delphinium Consolida*, apparently wild, attracted our attention. Near Sopley, about three miles before Christchurch, in the left-hand hedge, we gathered a few specimens of *Campanula patula*, almost past flower; and *Carduus tenuiflorus* and *Chenopodium murale* in several places along the road. One plant, which, though not very common, can hardly be called rare, was in such immense profusion in this neighbourhood, that it deserves a passing notice. *Chrysanthemum segetum* rendered many acres of land, as we came down the valley, perfectly yellow with its large bright blossoms. Commencing almost in the town, *Hydrocharis Morsus-ranæ* literally fills the ditches in the recorded station on the *lower* road towards Winkton; *Utricularia minor* occurs, sparingly, in company with it. A walk along the marshy sea-shore towards Muddiford produced only the usual sea-side plants,—*Aster Tripolium*, *Alsina marina* and *A. peploides*, *Crambe maritima*, *Salsola Kali*, *Eryngium maritimum*, *Plantago maritima*, and *Salicornia herbacea*,—but furnished splendid views

of the opposite chalk-cliffs of Alum Bay and the Needles, rising boldly out of the water at the extremity of the island.

From this point we struck directly into the Forest, to Brockenhurst, meeting with plain but comfortable accommodation at one of the little inns in the village. Half-past six o'clock the next morning found us in a beautiful autumn fog, through which the rays of the sun were just penetrating, searching the neighbourhood of Brockenhurst Bridge for its two special plants—*Leersia oryzoides* and *Isnardia palustris*. In a boggy piece of ground on the left, by the road-side about fifty yards before reaching the bridge itself, we soon found the grass, but much smaller and poorer than in its Surrey locality, at Brockham Bridge. After a much longer search, we also succeeded in detecting a few plants of the *Isnardia*, close by an open ditch recently cut through the bog, and which seems not unlikely to threaten the destruction, at no distant period, of both these plants in this particular locality. The *Leersia* has been noticed in various other spots, both up and down the River Boldre; and no doubt a diligent search would be rewarded by the discovery of other stations for the inconspicuous *Isnardia*. To Lyndhurst, a splendid walk of four miles, is considered the finest bit of road in the Forest, and for sylvan beauty can scarcely be surpassed, illumined, as we saw it, by the brilliant rays of the morning sun.

Having booked a bed, and despatched a comfortable breakfast, at the "Crown," we proceeded in quest of *the* plant of the Forest—*Spiranthes æstivalis*. Following the Christchurch road for two miles, as far as a toll-gate, we turned off to the right for about a hundred yards, and had no difficulty in identifying the bog where we expected at once to find the plant; but the best part of an hour was spent industriously, in both the driest and wettest parts, before the silence of the surrounding woods was broken by the shout of "hurrah!" which announced the discovery of the object of our search. A further long-continued examination of the bog was rewarded by only four or five additional specimens, distributed over a considerable extent of ground. They were past full flower; but, if the plant had been plentiful this season, the withered stalks would not have escaped our observation. It is very possible that, like its congener, *Spiranthes autumnalis*, it may vary in abundance in different years. This station does not correspond in many respects with that described by Dr. Bromfield (*Phytol.* iii. 909); and, as he mentions its having been found in other spots in the same neighbourhood, by Wm. Borrer, it is probable it may be a different one. The direction to the locality where we met with it

had been kindly furnished us by my friend, Jas. A. Brewer, of Reigate, who found it there, in plenty, last year. We could not detect anything peculiar in the place, and its accompaniments, that should have induced the plant to select it for its habitat. *Myrica Gale*, *Rhynchospora alba*, *Potamogeton plantagineus*, *Drosera rotundifolia* and *D. intermedia*, *Lycopodium inundatum* (particularly fine), and other more common bog plants were in abundance. One or two small tufts of *Osmunda regalis* in the centre looked stunted and unhappy. We did not observe this fern anywhere else. *Lastrea Oreopteris* seemed also to be remarkably scarce; as far as we noticed, it was confined to a damp ditch bounding one of the plantations; and I am not aware that we saw a single individual of the multiflora group. Proceeding onwards as far as the Christchurch-road Station, a bog near it, on the north side of the railway, yielded the pretty and rare *Cicendia filiformis*. Here we ventured to forsake the roads, and struck right across, through forest, over heath and bog, towards Stoney-cross, finding it a fine, but fatiguing, walk; and, with the sun for a guide, and inquiring, where we had the chance, which was but seldom, kept our direction pretty well. On both sides of the road, before coming to the little inn at Stoney-cross, as accurately described in Dr. Bromfield's Hampshire Flora, familiar to the readers of the 'Phytologist,' we found the minute *Tillæa muscosa*, in abundance. A pretty walk of three miles led us back to Lyndhurst, well satisfied with our day's work. There are but few districts affording three plants equal to the *Leersia*, *Isnardia*, and *Spiranthes* within the compass of an early morning's walk.

Our time being now exhausted, we left the Forest the next morning, by the Southampton road, as far as Redbridge, thence to the old town of Romsey, up the valley of the river Test, notorious for its trout, meeting with little worth mentioning, except two plants of *Hypocyanus niger*, occupying its usual position, on a bit of waste turf by the road-side. *Hippuris vulgaris*, *Sagittaria sagittifolia*, and *Rumex Hydrolapathum* occur almost wherever there is water in the marshy valleys which intersect this part of the county, and *Geum rivale* in several places along the canal that runs by Romsey.

The following are additional localities to those given in Dr. Bromfield's Flora, for some of the more interesting Hampshire plants observed during the past year:—

Cerastium arvense. Abundant on chalky road-sides on Queenwood-College Farm, near Stockbridge.

Gentiana Pneumonanthe. In considerable abundance by the side of a bye-road over a dry, heathy tract of ground, about three miles from Bishopstoke, towards Romsey.

Melittis Melissophyllum. Not unfrequent in woods and hedges about Tytherly and Mottisfont.

Hottonia palustris. Filling a ditch on the edge of a heath about a mile south-west of the Farnborough Station, on the South-western Railway.

Spiranthes autumnalis. On the cricket-ground at Norman Court.

Convallaria multiflora. Abundant in many dense oak-woods about Tytherly.

Ceterach officinarum. Wall of a sunk fence at Tytherly.

EDWARD T. BENNETT.

Queenwood College, Hants,
7th of 10th month, 1852.

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Thirty-eighth Sitting.—Saturday, October 23, 1852.—MR. NEWMAN, President, in the chair.

Hydnum coralloides, Scop., near *Burton-on-Trent*.

The President read the following note, from Mr. W. M. Hind, dated September 28, 1852 :—

“ I have to notice the occurrence of the rare and exquisitely beautiful *Hydnum coralloides*, Scop., in this neighbourhood. This graceful fungus was found growing from the lintel of a wine-cellar door, and was in beautiful condition when sent to me by the friend in whose house it grew. There were three principal branches, with their branchlets, all fringed with coralloid stalactites about an inch long, very closely set, and of almost snowy whiteness. It has lost much of its delicacy of colour and graceful appearance by drying, and comes more nearly now to the plant figured by Sowerby, t. 252. The specimen I possess measured seven inches in length by five and a half in breadth.”

Spinulose Section of Lastreas.

The President read the following note, from Mr. Lloyd, dated October 15, 1852 :—

“In a former number (Phytol. iv. 22) I gave my opinion upon *Lastrea uliginosa*; and I never intended to offer any further observations upon the subject until I read Mr. Moore’s proposition to unite it with *L. cristata* and *L. spinosa*. Now, *L. uliginosa*, as Mr. Moore truly observes, and as I believe almost all botanists admit, is quite intermediate between those two species, and might, I think, without any great violence to Nature, be joined to either of them, were not the other present; but joining all three together is quite a different affair, especially when we consider them as a part of a most regular gradation of forms, from the pinnate frond and pinnatifid pinnæ of *L. Goldiana* to the highly compound *L. multiflora* or *L. dilatata*.

“The plant which immediately follows *L. Goldiana* is the North-American form of *L. cristata*; and it differs but very little from *L. Goldiana*, except that it is a little more divided, and may be called sub-bipinnate. It is about half as large again in all its parts as the British form, is a fortnight earlier in its vernalion, and is as intermediate between it and *L. Goldiana* as *L. uliginosa* is between it and *L. spinosa*. It is the North-American, and not the British, form which is exhibited at the flower-shows. I shall make only one remark upon *L. uliginosa*, viz., that it is much larger than either *L. spinosa* or the English form of *L. cristata*, and about the size of the North-American form. I shall pass over *L. spinosa*; it is well known: but there is a plant, the next in the series, and one that has been much overlooked, which is intermediate between *L. spinosa* and the smaller *L. multiflora* or *L. dilatata*, and forms a connecting link between the glandulose and the eglandulose part of the section. Of the forms of *L. multiflora* or *L. dilatata* (if we except Mr. Newman’s *L. glandulosa*) I never could make more than two; one with fronds about two feet long, and a very prolific caudex; and the other with fronds four to five or even six feet long, and an arborescent, upright caudex, which seldom throws out any lateral crowns; and this plant, I am of opinion, is the *Polypodium spinosum* of old authors; and at a future time I shall give my reason for thinking it so.”

Cowslip in Flower in October.

The President read the following note, from Mr. A. W. Bennett, dated Brockham Lodge, October 16, 1852 :—

“I beg to enclose a specimen of the cowslip (*Primula veris*), gathered yesterday, the 15th of 10th mo., in *full flower*, in a disused chalk-pit in the Betchworth range of hills. One might go a long way before finding a more remarkable instance of the waywardness plants sometimes exhibit in their time of flowering. The primrose is sometimes met with on a sheltered hedge-bank, even during the most inclement winter's frost; but the cowslip we look upon as a more transient visitor of warm spring weather. The period assigned it in Babington's Manual is 'iv., v.,' and we should never expect to meet with it earlier than perhaps a few stray specimens in the beginning of the 4th, or a few still lingering till the end of the 5th, month. Is it early, or is it late? is a question on which opinions might be divided. Its locality, too, was most unusual for so peculiarly a meadow plant. The stony character of the ground in which it was growing is shown by the nature of the roots.”

Melampyrum pratense γ., Brit. Fl.

The President read the following note, from Mr. Wardale, dated October 19, 1852:—

“Having seen a notice, in the last edition of the ‘British Flora,’ p. 296, of the above-named variety of plant, and the locality therein mentioned, and perceiving that it has been entirely passed over in the third edition of the ‘London Catalogue of British Plants,’ may I beg the insertion of it in a page of the ‘Phytologist,’ as having another locality besides the ‘Banks of the Wye below Monmouth.’ On the 29th of June, 1849, on a visit to Hastings, it was proposed to make an excursion, as a morning's amusement, to Hollington, distant about four miles, to view the church there, which of itself possesses no other particular attraction beyond that of its unusual situation, being in the midst of a wood, and accompanied by a cemetery surrounded by a hedge and bank. The pathway immediately leading to the situation is between hedge-banks, presenting at the time a profusion of wild plants, including *Melica uniflora* and the *Melampyrum*. After passing the stile at the entrance, some hundreds of *Melampyrum pratense* γ. are instantly seen distributed throughout the place, and give a considerable degree of gaiety and cheerfulness to the scene. Young oaks and hazels form the wood, the former of which the proprietors had already begun to cut down, which, being denuded of their bark, did not exceed the diameter of seven or eight inches. The hazels are intended as a nursery for hurdles as they may be wanted, or according to their states of growth. The *Melampyrum* here gene-

rally shelters itself by the roots of the hazel, as the primrose is often found, in the spring, occupying similar situations. The plant, at a short distance, has somewhat the appearance of a small bush, with a stem rising to the height of about fifteen or eighteen inches, and four or five branches curving upwards; and, without being so handsome as *M. arvense*, with its variety of colours, it is not entirely devoid of some claim to beauty. The flowers are much larger than those of *M. pratense* collected in a wood by Hornsey, a little to the north of the turnpike-gate at Highgate, in 1835; colour lighter, attenuating nearly to white; leaves also larger, some being an inch in breadth at the base, and more than three in length,—shape lanceolate; spikes not so close as those of *M. arvense*, the acuminate floral leaves pointing upwards, in various degrees of elevation.”

Cyperus fuscus in Yorkshire.

The President read the following note, from Mr. J. G. Baker, dated October 20, 1852:—

“Whilst looking, a short time ago, through a bundle of unnamed Cyperaceæ collected in various parts of Cleveland, by Wm. Mudd, of Ayton, I was pleasantly surprised at finding amongst them a few specimens of *Cyperus fuscus*. Upon inquiring for further particulars, I am informed they were procured last season, in company with *Scirpus pauciflorus*, *Carex pulicaris*, *Fissidens osmundioides* and *F. adiantoides*, *Hypnum nitens* and *H. stramineum*, *Bartramia marchica*, &c., from an extensive swamp or bog on Guisborough Moor, about 400 yards from Codhill farm-house, and a mile due east from the well-known Roseberry Topping. The locality may be readily found by a stranger, or recognized in the map, as being situated directly between the rise of Sleddale Beck, one of the principal branches of the Esk running to the south, and that of the small stream that passes Guisborough, and runs into the sea at Saltburn, in an opposite direction, by reference to the altitude of Roseberry, which is stated to be nearly 500 yards (1488 feet). The elevation attained by the *Cyperus* may be estimated at 400 yards, which, in this latitude (55—56), though taking into consideration proximity to the sea, will indicate an average annual temperature as low as 44—45 degrees. Its occurrence in a locality so widely distant from those already ascertained in this country, will give it the advantage in dispersed area and zonal range over its more conspicuous congener predicted by Dr. Bromfield (*Phytol.* iii. 1017), from a consideration of its extensive distribution on the continent, and will considerably increase the probability of its

detection in many of the intermediate counties ; whilst its comparatively elevated position, in the present instance, opens the possibility of its ultimate discovery considerably to the north of Yorkshire.

Collomia grandiflora in Yorkshire.

The following note is also from Mr. Baker :—

“ We have noticed this native of North-Western America somewhat plentifully this autumn, in a cultivated field not far to the north of Thirsk. As it grows intermixed with a crop of barley, and appears confined to that portion of the field, it has most likely been introduced with the seed-corn, at no very distant date, and may possibly disappear with a change of cultivation ; but, on the other hand, as it has seeded freely, and has a tendency to multiply spontaneously when grown in gardens, it may ultimately become more or less permanently established here and elsewhere. For the benefit of those not acquainted with the plant, it may be briefly described as belonging to a genus of Polemoniaceæ, more allied to the well-known American Phlox than to our typical British representative of that natural order ; the species in question having a slender wiry stem, about a foot in height, which is usually simple, but occasionally branched in a fastigiate manner, with scattered, elongate-lanceolate leaves, more numerous and somewhat glandular towards its summit ; and clustered terminal heads of flowers, with glandular, ciliated calyx-segments, and a dull, saffron-coloured, Phlox-like corolla, hardly worthy of the specific designation.”

Errata in a previous Number.

The following corrections are supplied by the same kind correspondent :—P. 721, for “ Pail.” read “ Parl.,” for Parlatore ; p. 722, line 3, for “ Randolii ” read “ Baudotii ;” p. 722, line 17, for “ Hawnley ” read “ Hawnby ;” p. 724, line 21, for “ Mr. Baker ” read “ Mr. D. Oliver.”

Lastrea recurva in Mull.

The President wished to correct an error of his own, in the last number. The discovery of *Lastrea recurva* in Mull is no extension of its northern range. Mr. Watson (Cyb. Brit. iii. 272) records the possession of a specimen brought from Hoy Hill, Orkney, by Mr. Anderson ; and other northern stations are also mentioned by Mr. Watson, although with less certainty.

Extracts from the 'Report on Substances Used as Food,' exhibited at the Crystal Palace, in 1851. Reported by J. D. HOOKER, M.D., F.R.S., &c.

(Concluded from page 722).

FLOURS, AND PREPARATIONS OF THE PREVIOUS CLASSES.

Great Britain.—Amongst the various, but far from extensive series of flours from this country, Prize Medals have been awarded to—Kidd and Podger, Isleworth Mills, for Australian wheat-flour; Edward Chitty, of Guildford, for flour of English white wheat; and to Buck and Son, of Bradford, for oatmeal-flour.

Amongst the curiosities worthy of notice is the Typha meal prepared from the rhizoma of *T. latifolia*, by M. M'Callum, of Leith.

Australasia.—After what has been said of the cerealia of Port Adelaide, it is not surprising that the flours should prove of equal excellence, as is especially the case with those exhibited by H. E. and M. Moses, to whom Honourable Mention is awarded. Van Diemen's Land contributes some barrels of excellent wheat-flours: one of these from J. Walker is deserving of Honourable Mention; the others appear to have been injured by the voyage. The New Zealand "Maori flour" (or flour produced by the natives) is deserving of notice. Biscuits, so extremely well made as to have been awarded a Prize Medal, are exhibited by A. M. Milligan, of Van Diemen's Land;—these deserve especial notice, from the fact, that at a very recent period, the biscuit served out to the convicts, and to Her Majesty's Navy, when refitting in Tasmania, was said to be the refuse of the English dockyards, and was certainly unfit for food.

France contributes a most extensive collection of flours and preparations therefrom; amongst which it is very difficult to select for awards—the specimens are of such variety, as to merit and kind.

The magnificent gruaux wheat-flour of M. D'Arblay, jun., has occupied much of the attention of the Jury, not only as the best sample of European flour, but from the exhibitor being the inventor of the gruaux principle in grinding, whereby a great saving of the finest and most nutritive portion of the flour is effected, and any wheat-flour made to contain more or less gluten in proportion to starch. Hard wheats of all kinds, especially Sicilian, Russian, and Sardinian, from the large per-centage of gluten they contain, are the best adapted for this purpose. By means of D'Arblay's adjusting process, such grains are first ground high in the mill; the white

middlings are then separated by coarse sieves, and re-ground low in the mill; finally, the flour is repeatedly passed through fine silk sieves. This process is evidently tedious and expensive; but the flour produced is of the very finest description, especially for pâtés, and other preparations of that description. The average produce of flour thus obtained is 25 per cent. from ordinary wheat. Such flour is extensively imported into this country, for bettering the inferior flours, especially the Irish. D'Arblay's household flour, obtained by the usual grinding process, is also of first-rate quality. A Council Medal has been awarded to M. D'Arblay, "for his gruaux and household flour, obtained by a novel and economical process, for the fineness of its quality and utility."

OIL SEEDS AND THEIR CAKES.

Of this description of sheep and cattle food, there is a tolerable supply in the Exhibition, but no samples of remarkable merit, and only one novelty, the cotton seed-cake. Amongst the various seeds used in the manufacture of oil-cake, flax (or linseed) is the most important. Rape-seed is also employed, but is considered heating. In the Lubeck department a sample is exhibited of the "dodder-cake," made from the *Camelina sativa*. A small portion of inferior poppy-cake is contained in the Indian collection. Walnut-cake is not represented at all.

Great Britain.—The cotton seed-cake, exhibited by R. Burn (of Edinburgh), is a novelty worthy of especial notice, and was awarded Honourable Mention. The seed is recommended on account of its cheapness, being usually thrown away as refuse by the cotton manufacturers: it is extensively used as a cattle food, in an unprepared state, in various parts of the tropical world, and to a limited extent in England, but its success is doubtful, and in the shape of oil-cake it has possibly not yet been fully tested. Several samples of linseed-cake from Yorkshire are exhibited, some of which are better than ever appear in the London market; they are, however, inferior to the American.

HOPS.

The best hops are produced in England, and are chiefly cultivated in Kent and Sussex; they are also grown to a limited extent in Surrey, Essex, Suffolk, Herefordshire, Worcestershire, and Staffordshire, the soil and climate of each district giving a peculiar character to the crop. On the continent of Europe hops have been extensively cultivated, but never to perfection, the flowers having generally a rank smell and flavour. The plant has also been introduced into Canada,

Van Diemen's Land, and on the Himalayah mountains, with various success. The exhibition is, on the whole, good.

Great Britain.—A Prize Medal has been awarded to J. M. Paine, for his Farnham Golding's hops, grown on the phosphoric marl. These are fully ripe, and of fine flavour. The soil of this district is the very finest for the production of hops, but the growers often pull them too green.

Canada sends the best hops that have ever been imported from that country, and which, had they less of the "currant-leaf" flavour, would fetch a good price in our market.

Van Diemen's Land has grown hops for some years, and, it has been said, with success; but the specimens now exhibited are hardly recognisable, perhaps owing to defects in the packing, or accident during the voyage.

Belgium exhibits fair hops and of several varieties: these rank next to the Canadian in point of flavour.

Grand Duchy of Hesse.—The Mayntz hops are of good flavour, well harvested, though rather small, and have been awarded a Prize Medal; the Exhibitors are Stein and Schröder. Some Strasbourg hops are also good, resembling Golding's.

Russia sends a sample of unripe hops, better than usual, and which, were they sufficiently ripened, would probably rank next to the English in quality. This appears to be a common imported variety of the English "grape hop," and is from Count Koucheleff—it deserves Honourable Mention.

DRIED FRUITS AND SEEDS.

The series of dried fruits is very extensive, and the articles generally excellent in quality. Little novelty, either in product or import, is remarked, and none of invention in preservation. The divisions of this Sub-Class, proposed by the Royal Commissioners, are not here retained, the articles being considered in the aggregate, under each exhibiting country. Those preserved in sugar have been referred to another Jury.

From the *West Indian Islands* there are fruits, entire, of the Brazil nut (*Bertholletia excelsa*), from Trinidad; tamarinds and cashew nuts from Barbadoes. Demerara sends excellent fresh souari (butter nuts); dry bananas in slices, sweet but very poor; the monkey-pot fruit entire; limes; and bilimbi fruit preserved in pickle.

Van Diemen's Land exhibits good dried apples grown in the colony.

Cape of Good Hope.—A Prize Medal has been awarded to the fine collection of dried fruits from the Cape Colony exhibited by R. Clarence; of these the most remarkable are good sugary pudding-raisins, and a small black kind from the Constantia grape; flat dried pears, good; soft-shelled white-meated walnuts of great merit; good but flavourless almonds with formidable shells, and dried sliced peaches and apricots.

Wurtemberg.—Dried fruits for home consumption, and apparently much appreciated in the country, are exhibited; such as bilberries preserved in great quantities, which are flavourless; also some apples, pears, and cherries, which are better.

Spain.—The collection of Spanish dried fruits deserves Honourable Mention for general excellence. There are dried raisins, dried peaches, prunes, and thin-skinned figs; walnuts of great size and good flavour; almonds, Barcelona nuts, ground-nuts, pistachio nuts, chesnuts, and belotes.

Portugal.—The series from this country is particularly fine, and consists of copious samples put up in large bottles, all of good quality. Those contributed from Villa Real, by Pinto da Fonseca Vaz, consisting of plums, figs, pears, peaches, and apricots, have been awarded a Prize Medal. A Prize Medal is also awarded to J. L. Gomes, for his magnificent figs; and Honourable Mention is made of the dried pears of Pinto da Fonseca Vaz. Besides the above, there are from these and various other exhibitors almonds, walnuts, filberts, chesnuts, belotes, raisins, plums, &c.

TEA.

The exhibitors are few in this division, and have confined themselves to imports from the eastern world, whence this product is, however, admirably illustrated. China tea is exhibited in abundance, and of the finest quality. The British Indian produce, again, has never before been displayed in England as it is here by the Assam Tea Company, and the Honourable Court of Directors of the East India Company, who send good samples of the Himalayah and Java growths in the best condition. The Jury regret the absence of samples from Madeira, and especially from Rio de Janeiro, as also from Chittagong, and various other countries in which the cultivation of tea has been attempted with more or less success.

China Teas.—The collection formed by P. W. Ripley, at Canton, expressly for this exhibition, is quite unrivalled, whether we regard the excellence of the specimens, the completeness of the series, the

rarity and costly nature of many of its perishable contents, or the scientific value it possesses from the admirable arrangement followed. Some of the teas exhibited have never before been seen in England : whilst these and others command prices, in the China market, six times greater than the most expensive fetch, when sold retail, in England. Some are so perishable, that the voyage injures, and the subsequent keeping and exposure in the Exhibition ruins, them ; whilst all are curious and highly instructive ; circumstances quoted, to show how regardless of every consideration but the complete illustration of this branch of commerce, Mr. Ripley has been.

The Jury regret to find that the rules of the Royal Commissioners preclude Mr. Ripley from receiving any stronger proof of the high estimation in which his collection is held, than the award of a Prize Medal. The following scanty data are recorded for the information of the public, on a branch of industry which has never before been adequately illustrated.

Full chests of various Pekoe teas are exhibited, some of which fetch 50s. per lb in the China market ; whilst 7s. is the very highest price any of the sort will fetch in England, and this only as a fancy article. The plain and orange-scented Pekoes now fetch little with us, but as caravan teas, are purchased by the wealthier Russian families. The finest, however, never leave China, being bought up by the mandarins ; for though the transit expenses add 3s. to 4s. per lb. to the value when sold in Russia, the highest market-price in St. Petersburg is always under 50s. Among these scented teas are various caper teas, flavoured with *Chloranthus* flowers, and the buds of some species of plants belonging to the orange tribe, *Magnolia fuscata*, *Olea* flowers, &c.

The Cong-souchongs or Ning-yong teas are chiefly purchased for the American market. Oolong tea is the favourite drink in Calcutta, though less prized in England, its delicate flavour being injured by the length of the voyage.

For delicacy no teas approach those usually called "Mandarin teas," which being but slightly fired, and rather damp when in the fittest state for use, will bear neither transport nor keeping. They are in great demand among the wealthy Chinese, and average 20s. per lb., in the native market. The pouchongs, souchongs, and congos, better illustrate the English trade, and are of the most admirable description.

Of the Moyune district teas, there are eight varieties ; they are much prized in the American markets, but not so much so in

England. Among the most important curiosities in the collection are the counterfeit teas of Canton. These are made of any refuse, such as moistened tea-leaves from the pot, beat up with gum and rice-water in a mortar, coloured with Prussian-blue and gypsum, and curled, twisted, or granulated so ingeniously as to counterfeit the most costly varieties. The gunpowder and scented caper are over-done, the appearance of the counterfeit being more equal and beautiful than the genuine teas ever are.

Various curious teas used by the labouring classes of Chinese are exhibited ; some are merely coarse, and bad, sun-dried leaves ; better qualities, chiefly from Ankoy, are put up in baskets and boxes, and exported to the Islands of Java, &c. Curiously rolled and twisted samples, such as the “old man’s eyebrows,” “ball tea,” and other fancy manufactures, are all illustrated. Medicine teas follow these in the series, and consist of cakes, lozenges, &c., made of leaves mixed with various drugs, herbs, liquorice and sweetmeats.

Lastly, there are specimens of the plant itself, leaf, flower, and bud ; models and drawings to illustrate the processes employed in its manufacture, packing, and shipment ; samples of the materials used for scenting ; tea-pots, cups, &c.

Another collection of merit is that of W. P. Hammond and Co., which has also been awarded a Prize Medal. This contains, in 40 boxes, the various teas more or less abundantly imported into England ; and is further illustrated by good paintings of the processes employed in the culture, husbanding, and manufacture.

Java Teas.—Exhibited by the Singapore Committee of the Honourable East India Company. These teas are good of their kind, but not equal in flavour to the Chinese, or even to the Kemaon. In respect of flavour they resemble the Assam, but are inferior in strength.

Kemaon Teas.—Exhibited by the Honourable East India Company—are not very fully represented. In flavour, these rank next to the Chinese teas ; and, as a class, have rather the Ankoy flavour ; being better adapted for green tea than black. The manufacture is much improved of late. Three samples are exhibited ; imperial hyson, young hyson, and souchong ; for the two latter of which a Prize Medal has been awarded.

Assam Teas.—Eight boxes are exhibited by the Honourable East India Company—all full of well-made, strong teas, superior in this respect to the Chinese ; but much inferior in flavour, roasting, and scent. In point of manipulation they equal the Chinese. For mixing with the Chinese article they find a ready sale in the English market ;

and are in every respect superior to the ordinary tea—than which they command a much higher price. The quantities exhibited in these boxes are too small, and have consequently lost much of their flavour during the voyage and subsequent exposure.

The gray flowery pekoe is the best sample exhibited ; in appearance and flower it cannot be surpassed by any China tea, but is rather wiry in the leaf, from the buds having been gathered too young ; whence, perhaps, also its deficiency of flavour. It is of a much higher class than that of Kemaon and Java, and would command a high price in the English market. A Prize Medal is awarded to it.

Brick Tea of Tibet.—A sample of this curious product is exhibited by the Honourable East India Company. It is formed of the refuse tea-leaves, and sweepings of the granaries, damped, and pressed into a mould, generally with a little bullock's blood. The finer sorts are friable masses, and are packed in paper ; the coarser, as this, sewn up in sheep-skin. In this form it is an article of commerce throughout Central and Northern Asia, and the Himalayan provinces ; and is consumed by Mongols, Tartars, and Tibetans, churned with milk, salt, butter, and boiling-water, more as a soup than as tea proper. Certain quantities are forced upon the acceptance of the western tributaries of the Chinese empire, in payment for the support of troops, &c. ; and is, hence, from its convenient size and form, brought into circulation as a coin, over an area greater than that of Europe.

Assam Tea.—Sent by the Assam Company, and exhibited in the British Department. This collection is contained in twelve chests ; it is admirable, and in perfect order. As the indigenous plant has been manufactured in Assam, and the China plant has also been introduced and cultivated for the purpose, the exhibitors have judiciously sent samples of the different kinds of tea from each ; thus enabling the Jury to establish the superiority of the introduced Chinese plant, over the indigenous (or native Assam), for the manufacture. There is a decided advantage in point of flavour possessed by the Chinese leaf, though the manipulation appears perfectly equal in both. A Prize Medal has been awarded to the Assam Company, for this valuable collection of admirably-prepared teas.

SUBSTITUTES FOR TEA.

Of these, the Exhibition contains hardly any examples. One specimen of mate or "Paraguay tea" (*Ilex Paraguayensis*) is exhibited as a curiosity. This beverage is in universal use throughout Brazil, Uruguay, Paraguay, the Plate district, Chili, and Peru.

Dr. Gardner's prepared coffee-leaves are worthy of notice, as affording a really palatable drink when infused as tea is ; more so perhaps than coffee is to the uninitiated. That this preparation contains a considerable amount of the nutritious principles of coffee, is evident from the analysis ; but as the leaves can only be collected in a good state, at the expense of the coffee bush, it is doubtful whether the coffee produced by the berries be not after all the cheapest, as it certainly is the best.

COFFEE, COCOA-SEEDS, NIBS, &c.

Under this head the Jury have considered chocolates prepared for use, when plain,* or if only sugared, for ordinary use ; and have excluded such as are made into pâtes, as more properly belonging to confectionery department.

Many good samples of coffee are exhibited from various parts of the world, and amongst them some of excellent description from British colonies, which have never before been known to produce this article. On the other hand, there is a deficiency of specimens from the most important producing countries, as Jamaica, Dominica, Berbice, St. Domingo, Costa Rica, the Brazils, Manilla, and Java.

Of cocoa the same may be said : the best producing countries export the choice of their produce for the markets of Mexico, Spain, France, and Italy ; the high differential duty obliging our manufacturers to be contented with the inferior products of Trinidad, Granada, St. Lucia, &c. In chocolates (manufactured cocoa) France alone is well represented : England cannot, here, compete, for the reason just stated (under cocoa), and various adulterations are hence prevalent, the chief of which are potato-flour and sago.

Great Britain.—R. Snowden's patent purified coffee-nibs are the produce of an improvement in the method of preparing coffee for the table. The berry is split, and the husk (that formerly adhered to the whole berry), which is usually removed from all but the slit, is here extracted from that also : after which operation the berry is better adapted for roasting. The coffee thus prepared is of the finest quality. The illustration of the process is complete ; and ample specimens are exhibited. A Prize Medal has been awarded to Mr. Snowden for his new method of separating the tough membrane from the folds of the seed.

Java exhibits good coffee, but none of marked superiority ; Honourable Mention is made of one sample, marked as from the Menado district, which has a good, bold, well-formed berry ; and also to some

samples from Sourabaya; both are contributed by the "Singapore Committee" of the Honourable East India Company. The Java coffee is only prized in the market for its delicacy of flavour, as in point of strength it falls short of the West Indian.

The samples of *Aden* coffee contributed by the Honourable East India Company are not superior, and more resemble the Berbera (Abyssinian) plant, usually called long-berried Mocha, than the genuine Mocha. The specimens are dirty, and not sufficiently garbelled (picked). Aden, alias Mocha coffee, is, along with the other coffees of the Red Sea, sent first to Bombay, by Arab ships, where it is "garbelled," previously to its being exported to England. The bean is always broad and small, and the climate of India is supposed to improve its flavour.

Ceylon.—The great extent and importance of the cultivation of coffee in this island renders this department of the Jury's labours particularly interesting. The samples of both lowland and upland crops are, in general, excellent, and much useful instruction is conveyed by models of the drying-houses, sheds, and implements used in the manufacture of the berry; together with the latter, itself, in the different stages of the process of cleaning and drying, removing the pulp and husk, of which a portion, it will be seen, always adheres to the slit, and is ground in the mill, except when removed by Snowden's patent process, already alluded to.

Demerara, once the great coffee-country, now cultivates very little indeed. Many samples, of various growths, are sent from the few remaining estates. None are of much merit; the best (that from the estate "Klein Pouderoyen") is good. Pearl-berry coffee is also exhibited, and poor samples of cocoa.

Trinidad exhibits very poor coffee; apparently degenerated from plants originally of Mocha; and, from its want of aroma, is probably badly cured or damaged. The cocoa from the same island is truly magnificent, and such as is never seen in our market. Mr. Purdie, of Her Majesty's Botanic Garden, Trinidad, to whom the public are mainly indebted for the whole Trinidad collection, sends cocoa as prepared for both the English and Spanish. With regard to the Spanish, such has never been seen in England; every bean is very large, round, ripe, clean, and of a fine bright-red colour. The English is good of its kind, but is, literally, the refuse of the Spanish; the beans being lean, flat, half-ripe, flinty, and often bitter. A Prize Medal is awarded to the Spanish samples.

CHICORY AND OTHER SUBSTITUTES FOR COFFEE.

Judging from the number of exhibitors and samples, the cultivation of chicory is far from being extensive or remunerative. Few of the specimens sent are of much value, and none can, under any circumstances, represent coffee in flavour. As an adulteration the chicory may be profitable, and, supposing this to be its principal use, the exhibition of much was not to be expected.

There is a curious seed exhibited from Turkey called "Kenguel:" it is said to be extensively cultivated in the Kair-yr-eh and Komah; and roasted ground, and used like coffee. The plant is the "Gumelia."

TOBACCO.

The exhibition of raw and manufactured tobacco is (upon the whole) one of the most satisfactory of the class on which the Jury were called upon to decide. The import trade is very fully represented by numerous samples of excellent articles. The British, German, Algerine, and United States manufactured tobaccos for smoking and chewing are no less complete; and the products of the famous snuff-mills of Scotland, Ireland, Portugal, and Austria are all shown.

British Exhibitors.—The beautiful cases of W. Benson have been awarded a Prize Medal: they contain an epitome of the London tobacco trade; and amongst them a box of Havannah cigars, ticketed Flor de Cabanas, Partagas, and Martinez manufacture, stands pre-eminent for evenness and perfection of manufacture. The variously sized, coloured, and formed cigars in one box are stated to be all the produce of the same crop of tobacco; differences of colour and strength, and, in some degree, of aroma, also, depending upon the age of the leaf employed, and its position on the plant,—the oldest or lowest being used for the well-known (and extensively counterfeited) flat oily cigars called "Bravas."

Among other raw or leaf tobaccos, the American varieties are particularly well illustrated, but too insufficiently labelled to convey much information to the public, who would be glad to learn, from such a collection, that the commoner "shag tobacco," is prepared chiefly from the "Mason" county leaf; the mild "Kanaster" and similar qualities from the thin, delicately flavoured, mild, Ohio leaf; the common strong ships' tobacco, extensively used in the Royal Navy, from the Virginia leaf, &c.

Hungarian tobacco, almost unknown in Great Britain, is also

exhibited both in this and in the Russian Department. It is very fine, and of peculiarly delicate flavour, much more so than the tobacco usually cultivated in Turkey.

M. Hyams' samples of British-made cigars and cheroots, from the New Granada leaf, deserve notice from their extraordinary cheapness, as does his specimen of Columbian tobacco. The Jury also mention Buckland and Toplis for their neatly fabricated cheroots of tobacco, and other narcotic herbs and drugs, required as medicine or for luxury. A piece of wood at the mouth extremity retains the oil effectually (an old invention). These cheroots draw well, but are very rank.

The most important exhibition of German tobacco is that from Mannheim, sent by Wm. Sachs, which, unfortunately, owing to the lateness of the crop, arrived too late to be placed on the Award List. It is but fair to the producer to state that it has been pronounced superior in flavour, and in point of curing, to any European tobacco known in the English market. The Agricultural Society of Baden has encouraged the culture of this crop, which has rapidly increased to 200,000 cwt., annually grown on the banks of the Rhine. The cultivation is carried on by small proprietors, and employs 20,000 hands; and the produce is sold at a very cheap rate. It is exported in leaf, in vast quantities, to England, Belgium, Spain, and, in bad seasons, to the Havannah itself; and the cigars are consumed in the United States to a great amount. Great attention is paid to the selection of fine covering leaves, upon the goodness of which the burning and drawing so materially depend; and in this the manufacturers, judging from the samples exhibited, seem to have been eminently successful. Though still inferior to the best American tobacco, it surpasses much that is brought into the market.

The Spanish department excels all others in the beauty and variety of its cigars. The Havannahs are here alluded to, for the Manilla cheroots are scarcely represented in the Exhibition, which is very much to be regretted.

The best Havannah tobacco-farms are confined to a very narrow area on the south-west part of the great island of Cuba. This district, 27 leagues long and only 7 broad, is bounded on the north by mountains, on the south and west by the ocean, whilst eastward, though there is no natural limit, the tobacco sensibly degenerates in quality. A light sandy soil, and rather low situation, suit the best. Of the small collection of cigars shown, two exhibitors have been awarded Prize Medals. The one, Don Buenaventura Gonzalez Alvera, for his "Ramas" cigars: these are considered the best it is possible to pro-

duce, and fetch £30* per 1,000 in the Havannah ; they proved extremely fine in flavour, and perfect in burning qualities, but they were so tightly rolled as to draw with difficulty, which is rather considered an advantage by the Spaniards in this cigar. The other Prize Medal was given to a much milder cigar, drawing freely, and considered equally deliciously flavoured, by the Jury ; the exhibitor is known as De Cabanas and Cabazel.

STARCHES.

There are two remarkable and closely-allied substances, brought together from countries almost at the antipodes of one another, and both new to the Jurors ; the one is a starch washed from a species of *Zamia*, found wild in St. Domingo, and exhibited by Sir R. Schomburgk : the taste is odd and salt, as if it had been immersed in lime ; in its present condition it can be regarded as a curiosity only. The other is a starch from a West Australian *Zamia* : this would appear, in quality, to rival arrowroot, which, in every respect of feel and taste, it resembles.

SUGAR.

Maple Sugar.—This substance, which is abundantly used in America for common purposes, has hardly had a fair trial in England, owing to the cheapness of the colonial cane-sugars, and the difficulty of depriving the maple produce of its peculiar flavour. If it promised success, the cultivation of the sugar-maple tree might be almost indefinitely extended in Canada over a large area, well suited to this tree, but unfit for pasture and agriculture. There are few samples exhibited, but to three of them Prize Medals are awarded ; two—in the United States—to W. Barnes and L. Dean ; the other to A. Fisher (Canada), for the sample of double-refined sugar, which is of superior colour and grain. Honourable Mention is also made of that from J. Bales, of Canada.

* A friend of ours, lately returned from the country, says that £6 15s. 4 thousand is the highest price he has ever heard mentioned for cigars. This, being exactly 30 dollars, suggests the idea that “ pounds ” in this instance has been inadvertently substituted for “ dollars.”—*Ed. Phytol.*

*Report of the Botanical Proceedings of the Twenty-second Meeting
of the British Association for the Advancement of Science.*

THE President, before announcing the first paper, adverted to the decease of the late William Thompson, of Belfast; and concluded by moving a resolution, to the effect that the Section desired to put on record their deep regret at the loss which science and humanity have sustained by the sudden and premature death of this distinguished naturalist.

*On the Altitudinal Ranges of Plants in the North of Ireland, by
Prof. Dickie, M.D.*

The observations were made on Slieve Donard in the County Down, attaining an elevation of 2796 feet; Muckish and Erigal, in County Donegal, the height of the former being 2190 feet, of the latter 2450 feet; and Nephin, in the north-west of County Mayo, its elevation being 2639 feet. It might have been expected that in general the species noted would have the upper and lower limits of each respectively obeying the usually understood law; instead of which, it appears that their natural upper limits are, with a very few exceptions, lower in the North of Ireland than in North Britain. The lowest limits of plants usually found at high elevations were next examined, and those of twenty species in Ireland compared with their recorded lowest limits in different parts of North Britain; from which comparison it appears that the lower limits in Ireland are generally much lower than in North Britain. It may be stated, in other words, that in Ireland, with a climate which is generally mild, plants usually growing in low grounds do not rise so high upon the mountains as in North Britain, with a less favourable climate; and plants usually growing at high elevations descend lower in Ireland than in many parts of North Britain.

Prof. Balfour had often observed a considerable descent of alpine plants. *Draba incana* he had found on the sea-shore. *Saxifraga oppositifolia* was found very low near Glasgow.

Prof. Walker-Arnott mentioned several instances of alpine plants descending to the sea-shore, as *Saxifraga aizoides*. He thought those plants descended which grew in the vicinity of streams, and would divide alpine plants into dry and moist. There was a considerable difference in the distribution of plants, according as they grew on continents or islands.

Mr. L. Reeve observed, that the lines of distribution of many of the plants referred to by Prof. Dickie corresponded with the isothermal lines of Humboldt.

The Prince of Canino thought it of first importance to distinguish between dry and wet alpine plants. In investigations on the distribution of plants, care should be taken to take into consideration the physical properties of the soil.

Mr. Wyville Thomson had found alpine plants at the mouth of the river Dee, but not in its course. He thought this was due to the sea supplying the warmth low down which the snow did higher up; neither snow nor sea protecting the plant in the middle parts of the river's course.

Dr. Lankester read the Report of the Committee on the Registration of the Periodic Phenomena of Animal and Vegetable Life, and stated that two sets of tables only had been filled up of those which had been sent out by the Association. Those sent in were from Miss Llewellyn, of Penllegare, near Swansea, and from Mr. Matthew Moggridge, of Swansea.

Morphological Analogy between the Disposition of the Branches of Exogenous Plants and the Venation of their Leaves, by Prof. M'Cosh.

The author said that the view which he took of the morphology of the plant might be regarded as an extension, in the same direction, of the theory of Goethe. According to this theory, all the appendages of the axis of the plant, including leaves, bracts, sepals, petals, stamens, &c., are formed on a common plan, of which the leaf may be taken as the type. It had occurred to him (Dr. M'Cosh) that we may regard the branches of the plant and the whole plant as formed on the same plan. We may thus regard the plant as constructed on one model throughout. Speaking in this paper of reticulated leaved plants, he showed that there is a correspondence between the disposition of the branches along the axis and the distribution of the venation of the leaf. 1. In some plants the lateral branches are disposed pretty equably along the axis, whereas in others a number are gathered together at one point, and the plant becomes in consequence verticillate or whorled. Now, he found that wherever the branches are whorled, the leaves of the plant, as in the *Rhododendron*, or the veins of the individual leaf, as in the common sycamore and lady's-mantle, are also whorled. 2. He showed, further, that when the leaf has a

petiole, the tree has its trunk unbranched to near the base (as in the case of the sycamore, apple, &c.), and when the leaf has no petiole the trunk is branched from the root, as in our common ornamental lawn-shrubs, the bay-laurel, holly, box, &c. 3. He showed, further, that the angle at which the branches go off from the axis is the same as that at which the side veins go off from the main veins. His observations during the past summer had been chiefly directed to this point; and he made the measurements by means of a graduated circle with a movable index. In these measurements, he took the angle formed by the main lateral branches with the axis, and by the main lateral veins with the midrib. The angle of the veins of the leaf is easily taken. It is more difficult to determine the natural angle of the branches, inasmuch as the direction of the branch may be modified by a variety of circumstances, as by winds, its own weight, &c. Still, there is evidently a normal angle for each species of plant, which may be ascertained by taking the average of a number of measurements of a freely-growing plant. He had measured in all about 210 species of plants, and found the angle of the branch and of the vein to correspond. He produced a tabulated statement of these 210 plants, and called the special attention of the Section to several of them.

The Black and Green Teas of Commerce, by Dr. Royle.

It was a remarkable fact, that the subject of the difference between the black and green teas had been until recently a matter of great uncertainty. The Jesuits, who had penetrated into China, and Mr. Pigou, were of opinion that both the black and green teas were produced from the same plant; while Mr. Reeve believed that they were manufactured from two distinct plants. Now, as regarded himself, he (Dr. Royle) had adopted the view that the best kinds of black and green tea were made from different plants; and examination of tea samples seemed to confirm that view, but a repetition of the experiment had not done so. Mr. Fortune, subsequent to the China war, having been sent out to China by the Horticultural Society of England, made inquiries on the subject. He there found the *Thea Bohea* in the southern parts of China employed for making black tea; and in proceeding as far north as Shanghai, he found the *Thea viridis* used in making green tea near the districts where the best green tea was made. So far, therefore, the information obtained seemed to confirm the view of two different species of *Thea* being employed to make the two different kinds of tea; but Mr. Fortune, in visiting the dis-

trict of Fokien, was surprised to find what he conceived to be the true *Thea viridis* employed in making *black* tea in districts near where the best black tea was made. He took plants with him from Fokien to Shanghai, and could find no difference between them. It was still, however, desirable, to get specimens from the district where the black and green teas of commerce were actually made; and this had latterly been effected. In consequence of the great success which had attended the experimental culture of tea in the nurseries established in the Himalayas, Mr. Fortune was again sent to China, by the East India Company. He proceeded to the northern parts of the country, in order to obtain tea-seeds and plants of the best description, as the most likely to stand the Himalaya climate. Mr. Fortune procured seeds and plants in great numbers, and sent them to the Himalayas, where they had been since cultivated. When he had reached Calcutta, the tea-manufacturers, whom he had brought with him, made from plants in the Botanic Gardens their black and green tea from the same specimens; so that it was evident it was the process of manufacture, and not the plant itself, that produced the green tea. All now who were acquainted with the difference between black and green teas, knew that they could be prepared from the same plant without the assistance of any extraneous materials, though it was a common thing for manufacturers to use indigo, Prussian blue, turmeric, &c., in colouring the tea. Dr. Royle showed specimens of the black-tea-plant from the Woo-e-Shan, and of the green-tea-plant from the Hwuychou districts. No specific difference could be observed between the two specimens.

Growth and Vitality of Seeds.

Dr. Lankester read the 'Twelfth Report of a Committee appointed to make Experiments on the Growth and Vitality of Seeds.' The seeds set apart for this year's sowing were those collected in 1844. It was the third time the same seeds had been experimented on; and it was found that there was a very evident decrease in the numbers which have vegetated, compared with those of previous sowings. Dr. Lankester explained the object of the Committee, and stated that the fact of raspberry-seeds growing, which had been taken from the stomach of the body of a human being buried in a tumulus in Dorsetshire, and which had been doubted, had been re-investigated during the past year; and there seemed no reason to doubt that the seeds thus buried for centuries had germinated.

Dr. Royle stated that, having been present when the original mass

of matter from the stomach of the dead person was brought to Dr. Lindley in London, and the raspberry-seeds discovered in it, he had no doubt of the correctness of the conclusion, that the seeds which had thus been swallowed and buried had germinated after the lapse of centuries.

On a Microscopic Alga as a Cause of the Phenomenon of the Colouration of large Masses of Water, by Prof. Allman.

It appeared in little conglomerated gelatinous-like masses; and when submitted to the microscope, it was found to consist of a number of fronds. The younger fronds were nearly spherical, and consisted essentially of a central mass of transparent gelatinous matter, surrounded by a crust composed of minute cells, containing a green colouring substance. The crust, being much slower in its growth than the internal nucleus, soon bursts; and the nucleus then, by an apparent spontaneous action, assumed a regular form, not unlike an hour-glass, which soon separated into two distinct fronds. Some of them being put into a glass tube, and placed in the window, were observed to arrange themselves in a mass on the side of the tube opposite to that exposed to the sun's rays, that side of the mass towards the light being formed into a beautiful concave curve, which might, he thought, when fully investigated, reveal some important facts as to the nature and influence of light.

On the Distribution of the Marine Algæ on the British and Irish Coasts, with reference to the (probable) Influence of the Gulf Stream, by Prof. Dickie.

There were, the author said, forms of Marine Algæ generally admitted to be characteristic of our northern coasts, and others of the southern. The remarks he was about to make referred to those generally deemed of southern type; that is, those which usually are more or less abundant in low localities, and, on the other hand, are absent from high latitudes. Such species, natives of our coasts, may be classed under three heads: first, those confined to the southern parts of Great Britain and Ireland; second, species of more extensive range, since they extend to the north of Ireland and south-west of Scotland; third, those found abundantly in the south of England, and ranging along the western coasts of both islands as far as Orkney and Shetland: and the species enumerated under these three classes, and amounting to more than twenty, are, so far as we can ascertain up to the present time, absent from a certain part of the east coast of Scot-

land. A considerable proportion of them re-appear in Shetland and Orkney. The marine vegetation in these northern islands resembles that of the north of Ireland, though there is a difference between them of from four to five degrees of latitude. The marine plants of some of the north-eastern counties of Scotland, intermediate in latitude, are of more boreal character. The drifting of tropical fruits, &c., to the western and northern parts of Ireland and Britain, is a proof of the direction and presence of the Gulf-stream; the development of southern forms of Algæ at the extreme northern parts is a proof of the same, and, moreover, seems an indication of its influence in reference to temperature. Are we to consider their absence from certain parts of the east coast of North Britain as owing to a lower sea temperature than in localities where they exist? The portion of the coast in question is precisely that which, from the generally understood course of the Gulf-stream, may be least exposed to its influence. Investigations respecting the temperature of our seas are, however, still desiderata; and, without such, an important modifying element has been overlooked having reference to the climate of the British Islands.

Prof. E. Forbes said that the distribution of marine animals corresponded with that of marine plants. The same anomalies which Dr. Dickie had pointed out with regard to plants existed with regard to animals. Less attention had been given to the distribution of marine Algæ than to almost any other organic existences. With the exception of the labours of Dr. Harvey, little or nothing has been done. We wanted a more accurate knowledge of the temperature of the ocean at different depths. [This hint resulted in a subsequent recommendation from the Section, that the Government would prosecute this inquiry.]

Prof. Walker-Arnott said that he possessed waggon-loads of Algæ from all parts of the world, which were greatly at the service of any botanist who would work at them. The collecting part of the task had been done; the naming and arranging were now alone necessary. Dr. Harvey could do no more than he had done at present.

Report on the Influence of the Solar Radiations on the Vital Powers of Plants growing under different Atmospheric Conditions, by Dr. J. H. Gladstone.

As a preliminary matter of inquiry, the mere effect of coloured media in accelerating or retarding the growth of various kinds of plants was tried. Hyacinths were chosen as the sample of bulbous-rooted plants. Roots of as nearly as possible the same size and description

in every respect were grown under the various bell-glasses. Certain differences were described, both in the rootlets and the leaves, which might fairly be attributed to the character of the light. The time of flowering, and the flowers themselves, were not affected by it; and the greatest growth (estimated quantitatively in each instance) took place in the plant exposed to all the rays of the solar spectrum; the next greatest was under the blue glass. Wheat was also grown in a similar manner, the method of arrangement of apparatus being minutely detailed, and the character of the corn-plants which appeared under the various glasses. Those under the yellow were the most sturdy in their growth; those under the blue the least healthy; whilst some grown under a nearly darkened shade grew quickly nine inches long, put forth no secondary leaves, and died in a month. Mallows were grown in a similar manner. The detailed observations were to much the same purport as in the preceding instance. As it had been formerly observed by the author and his brother, that plants kept in an unchanged atmosphere appear to enter into a sort of lethargic condition, experiments were instituted for the purpose of ascertaining whether the alteration in light produced by coloured media made any marked variation in this matter. The pansy and the *Poa annua* were the plants selected; and comparative experiments were made with a darkened shade, and with no covering at all. The results were various, but scarcely conclusive, unless in reference to the fact that plants survive much longer for being in unchanged air. The colourless and yellow media appeared most favourable to the healthiness of the plants. As experiments on growing plants must stretch over a considerable time, the author's observations were not put forth as foundations for any generalization, but just as samples of his preliminary attempts.

Trifolium repens.

The Rev. Prof. W. Hincks described an anomaly of the *Trifolium repens* (white clover), in which the pedicels of the flowers were very much elongated, and the petals and pistil converted into leaves.

On the Transmutation of Ægilops into Triticum, by Major Munro.

The author laid on the table a series of specimens which seemed to indicate a gradual transition from plants recognized by botanists as belonging to the genus *Ægilops* into those having the characters of the genus *Triticum*. He suggested that, as we had no wild representative of the *Triticum hyperboreum* which yields wheat, it might have been derived from a species of *Ægilops*.

Remarks on the Flora of the South and West of Ireland, by Prof. Balfour.

This communication contained the results of a three-weeks' tour with some of his pupils in the southern and western districts of Ireland, *viz.*, in the counties of Cork, Kerry, Limerick, and Galway.

Nees von Esenbeck.

THE following circular has been printed, and sent to many of our most distinguished naturalists. The readers of the 'Phytologist' will please to regard it as addressed to each of them:—

“ 9, Devonshire St., Bishopsgate,
“ July 19, 1852.

“ Sir,—That eminent and truly philosophical naturalist, Nees von Esenbeck, having been reduced to circumstances of a most distressing nature, through being deprived of his Professorship in the University of Breslau, I have the honour to inform you that, with a view to affording him some temporary relief, a subscription has been set on foot, to which I very respectfully and earnestly solicit the addition of your name.

“ The following sums have been offered; and it is requested that further contributions may be sent, either in cash payment, Post-office order, or postage-stamps, to my address, as above; and the receipt will be acknowledged on the wrappers of the next published numbers of the 'Zoologist' and 'Phytologist,' or in any other way the donor may require.

“ EDWARD NEWMAN.”

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The following letter has been received from Professor Nees von Esenbeck :—

“ Breslau.

“ Respected Sir,

“ I have received, with heartfelt thanks, the present of £20, which, nobly sympathizing with my misfortunes, and influenced by feelings akin to my own, you have enclosed in your letter.

“ This truly acceptable present not only supplies the pressing necessities of the outward man, but at the same time administers consolation to the spirit within, and gives it assurance that, although lonely and deserted in the land of its birth, and looking around in vain for sympathy there, it yet receives that sympathy from the home of freedom in the human race.

“ I experience a feeling of deep shame in the neglect I have suffered in my own country, as contrasted with the kindness evinced by yours, since it argues that ours is a less noble race, less forward to assist the distressed, less powerful in freedom.

“ When, however, the free man, in the spirit of a brother, offers us his hand, we press it to the heart, as I now, in thought, do yours, thanking and blessing you. Be pleased to convey these sentiments to those who have, through you, afforded me this consolation and assistance.

“ I am, with sincere respect,

“ Yours most devotedly,

“ NEES VON ESENBECK.

“ To Edward Newman, Esq.,

“ &c., &c., &c.”

As soon as the subscription-list appears to warrant such a course, a second £20 will be forwarded.

PROCEEDINGS OF SOCIETIES, &c.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, November 11, 1852. (Seventeenth Session).—Dr. Sel-
ler, President, in the chair.

Various donations were announced to the Society's library and herbarium, and also to the Museum of Economic Botany at the Royal Botanic Garden.

The following papers were read:—

Tubular Structure in Plants.

'On the Development of Tubular Structure in Plants;' by R. Hobson, M.D., Cantab., Leeds. Communicated by Dr. Balfour.

The object of this paper was to show the mode in which tubular structure is formed by the aggregation of cells in a linear series, and the subsequent absorption of the partition walls. The structure selected for observation was the moniliform hair found on the claw of the spurred petal of the heart's-ease (*Viola tricolor*). The author stated that "If the structure of the tube is traced, under the microscope, from the root, or base, upwards, the lower part will be found fully formed (tubular), having gradually substituted a tubular for its previously cellular formation. A little higher up, absorption of the partition walls (the united portion of the cells) is yet incomplete, being *in transitu* from cell into tube; whilst the remaining part is entirely cellular to the extreme point, which point is, in fact, a simple cell.

"There may be distinctly seen, in a portion of this multicellular tube, near to its base, marks sufficient to prove that those points of the cells which have been primarily in union to form the tube have now been absorbed, or in some other way removed, and that this absorption, or removal, has taken place precisely in an equal degree from the centre of the different septa, or united portions of the cells, towards the periphery of the tube, to the extent required to perfect Nature's 'handiwork.' The marks to which I allude are triflingly apparent annular contractions."

The author also made some observations as to the time occupied in the formation of the tubes. He remarked:—

"In order to ascertain whether the mutation of cell into tube occupied much time, I instituted a comparison between the tubular portion of the hair on the full-blown flower, and that on the flower just

opening, and found that the lower portion of the tube on the former (the full-blown flower) had generally become tubular to the amount of from eight to ten cells in each hair, which usually consisted of from twenty-five to thirty cells; whilst that of the latter (the opening flower) had become tubular only to the extent of about two or three cells. It therefore seems that the time occupied between the first opening of the flower and its fading period is sufficient to convert six or eight cells into tube; and it is probable that in the earlier part of the season, during more genial weather, the fading stage would be delayed, and consequently that in proportion as the blooming period is prolonged, the length of the tubular formation would be increased; but it seems doubtful whether these tubes ever become tubular throughout their *entire* length.

“On the two contiguous petals, on the inner and inferior part of each, on a prominence where the claw takes its origin, there is a ridge of hair of a totally different character from that on the claw of the spurred petal, being at all ages pervious *throughout*, dilating gradually from its base to within a trifle of its extremity, when it again gradually lessens in diameter, until it terminates almost spherically. There is not any second cell to be detected in any portion of *these* tubes, even before the flower opens. *Their* origin and termination seem to be a simple cell, lengthening and dilating; and therefore they are clearly unicellular. In the multicellular tube it is evident that, in order to secure a *tubular* structure, Nature clearly manifests her intention, by generating a single linear series of cells; and that this multicellular tube shall be a *cone* she as clearly manifests her determination, by generating cells gradually decreasing in transverse diameter from the base to its apex; and it would seem that where she has completed her cellular arrangement as regards their position and formation, her subsequent care is, by some peculiar and amalgamating process, to unite the adjoining cell-walls into one compact septum, denominated a partition wall.

“As regards this septum, it is not unreasonable to hope that repeated and minute microscopical investigations of the progressive growth and formation of the multicellular tube, at different periods of its age, may furnish material data on which to found a knowledge of the probable mode of its absorption, or removal.

“To discover whether the comparative *increase* of growth of the opening and fading flower kept pace with cellular conversion into tube, I measured the transverse diameter of the tubular portions of the two stages of growth of a *cultivated* plant, and found that the ave-

rage transverse tubular diameter of the hair of the *multicellular* tube of an ordinary full-blown flower in September was 1-1540th; whilst the tubular diameter of the opening flower was 1-2320th, giving an increase, during the blooming period, of 1-774th.

“The average of the tubular diameter of the unicellular tubes, which had been exposed to light and air, in the full-bloom flower of the cultivated plant was 1-928th; whilst the tubular diameter of the opening flower was 1-1546th, giving an increase, during the blooming period, of 1-618th. On measuring the transverse diameter of the *multicellular* tube of the full-blown flower in its native state, I found it to be 1-3437th; whilst that of the opening flower was 1-2566th, giving an increase, during that portion of the blooming period, of 1-871th.

“The diameter of the unicellular tube of the wild flower, which was full blown, measured 1-182th; whilst that of the opening flower was 1-1370th, giving an increase of 1-688th.”

The paper was illustrated by drawings, and by specimens under the microscope.

Cumberland Forms of Myosotis.

‘On the Cumberland Forms of Myosotis;’ by Mr. James B. Davies.

In this paper the author, after describing various forms of *Myosotis*, of which specimens and drawings were exhibited, called attention to the *Myosotis palustris*, var. *strigulosa* (Reich.). This, in its true form, occurs plentifully at Duddingston Loch, where it was detected some years ago, by Mr. J. T. Syme.

Cumberland Plants.

‘On the Plants found in Cumberland, in June, 1852;’ by Mr. James B. Davies.

The author gave a detailed account of the species which he had found in the Lake district of Cumberland during the month of June. Among the plants noticed were the following:—*Rosa inodora*? *R. micrantha*? (near Applethwaite, under Skiddaw), *Rubus saxatilis* (Walla Crag), *Hieracium aurantiacum* (Vicar’s Isle, doubtfully native), *Corydalis solida* (do.), *Alchemilla alpina* (between Walla Crag and Falcon Crag), *Oxyria reniformis*, *Saxifraga aizoides*, *S. stellaris* (near Grassmere), *Luzula Forsteri* (in many places), *Galium boreale* and *G. Mollugo*, *Scrophularia vernalis*, *Carex vesicaria*, *Orchis pyramidalis*, *O. latifolia*, var. *incarnata*, *Habenaria albida*, *H. bifolia*, and *H. chlorantha*.

THE
PHYTOLOGIST:
A
POPULAR
BOTANICAL MISCELLANY,

CONDUCTED BY

EDWARD NEWMAN, F.L.S., MEMB. IMP. L.-C. ACAD.

VOLUME THE FOURTH.

(CONCLUDED).



LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

M.DCCC.LIII.

Ye field flowers ! the gardens eclipse you, 'tis true,
Yet, wildings of Nature, I doat upon you,
 For ye waft me to summers of old,
When the earth teem'd around me with fairy delight,
And when daisies and buttercups gladdened my sight,
 Like treasures of silver and gold.

CAMPBELL.

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- The Botany of the Malvern Hills. By Edwin Lees, F.L.S., &c. Second Edition, enlarged and corrected. London: Bogue, Fleet Street. . . . 796
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'THE PHYTOLOGIST' will be continued both as a monthly and an annual publication. As a monthly, it will contain thirty-two pages of letter-press, occasionally accompanied with figures of New British Plants; it will be on sale two days before the end of every month; and will be charged one shilling. As an annual it will be sold on or about the 1st of December; will contain twelve monthly numbers, bound and lettered uniformly with the present volume; and will be charged thirteen shillings. An alphabetical list of Contributors is published once in the year.

THE PHYTOLOGIST

FOR 1853.

Notes on the Rarer Plants occurring in the Neighbourhood of the Estuary of the Taw and Torridge, North Devon. By GEORGE MAW, Esq.

PERHAPS a list of the rarer plants growing in the neighbourhood of the estuary of the Taw and Torridge, may not be unacceptable to those of your readers who may occasionally vary their botanical rambles by an excursion to some locality distant from their own neighbourhood. To such, I can strongly recommend the north-west coast of Devon for a week's sojourn. I know of few districts that would better repay a little careful examination, or where such a variety of our rarer species occur within a comparatively small compass.

In describing the Flora of any district, I think it well that its limits should be defined rather by natural peculiarities than mere arbitrary measurements; and therefore, before enumerating the plants, I shall give a slight sketch of the principal geographical and geological features which characterize the locality under consideration as a *natural district*. It may be divided into two portions: firstly, that consisting of the post-tertiary or alluvial deposits, partially filling up the valley of the estuary; secondly, the higher land of the secondary formations surrounding it. The flat alluvial country has a coast-line along Barnstaple Bay, of seven or eight miles, and extends inland at this width for about three miles; after which, it gradually narrows up to Barnstaple, where, at seven miles from the sea, it terminates. The Taw, running from Barnstaple, in a westerly direction, unequally divides it into two portions, that to the north of the river (of which Braunton Burrows form a part) being the most extensive. The Torridge, flowing from Bideford towards the north, sub-divides the southern portion into Northam Burrows on the west bank, and Instow Burrows

on the east side of the river. Braunton Burrows is a district of sand-hills, about four or five miles in length, skirting the coast from the north bank of the estuary to a raised beach, which forms part of the northern boundary of Barnstaple Bay. They extend inland from two miles to two miles and a half, when they gradually merge into the flat marsh which occupies the remainder of the valley. The sand-hills vary from ten to thirty or forty feet in height, and are continually receiving fresh accumulations of sand from the sea, which renders them, immediately on the coast, almost devoid of vegetation. *Amphipha arundinacea* is here almost the only plant that survives the repeated interments; and by the aid of its fast-growing stolons, which readily penetrate the loose sand, it easily re-establishes itself on the surface, even when buried at a considerable depth. Vegetation gradually improves as we recede from the coast, and is richest on the inland boundary of the sand-hills, where they are intersected by several moist, flat valleys. These are the habitats of some of the most interesting plants of the district; amongst which, *Scirpus Holoschoenus*, *Bartsia viscosa*, and *Teucrium Scordium* stand foremost in point of rarity. The marsh-land to the east of the sand-hills is partially under cultivation; but the greater part is unenclosed, and covered with a maritime vegetation. The most prevalent plants here are *Juncus maritimus* and *J. acutus*. The latter attains a great height, many tufts being considerably taller than a man.

Northam Burrows consist of a salt-marsh, about 800 acres in extent, bounded on the west by the sea, and on the north and east by a narrow belt of sand-hills, which separates it from the estuary. Extending from the cliffs on the south side of the bay to the mouth of the river, is a high bank of boulders, known as Northam Pebble-ridge, which protects the marsh from the inroads of the sea.

Instow Burrows are situated on the east bank of the Torridge, at its confluence with the Taw. They are less extensive than either Northam or Braunton Burrows, and consist of a small range of sand-hills skirting the rivers, which, further inland, give place to an unreclaimed marsh, similar to that on the opposite shore.

The higher land to the south of the alluvial valley is situated at the northern extremity of the barren carboniferous beds of Devon. They consist of highly contorted beds of gritstone and shale, thrown into long, rounded hills, running east and west, the anticlinal areas of the strata being in that direction.

The barren carboniferous strata are bounded on the north by beds of a dark gray limestone, interstratified with a compact slaty rock,

and separated by them from the metalliferous slates, of more ancient date, which occur to the north of the valley.

Besides the lower secondary formations of the neighbourhood, a small outlier of the green sand caps a hill about two miles and a half to the south-west of Bideford; and the lower new red sandstone, entering on the carboniferous girts, forms a low cliff, for about half a mile along the coast at Peppercombe, a small village, at the south-eastern extremity of Barnstaple Bay.

In enumerating the plants of the district, I shall consider them under two heads: firstly, those occurring in the low alluvial valley, with which will be included most of the maritime species; secondly, those growing on the higher land in the immediate neighbourhood.

Plants of the Alluvial District.

Ranunculus Flammula, L., β . *reptans*, Lightf. Moist spots between the sand-hills of Braunton Burrows.

Glaucium luteum, Scop. Near the raised beach of the north extremity of Braunton Burrows; Instow Burrow.

Cakile maritima, Scop. Near the larger light-house, Braunton Burrows; west bank of the Torridge, a short distance below Bideford.

Cochlearia Anglica, L. Banks of the Torridge, near Bideford.

Matthiola sinuata, Br. Raised beach to the north of Braunton Burrows.

Reseda lutea, L. Sand-hills of Braunton Burrows.

Viola lutea, Huds., β . *Curtisii*, Forst. Braunton and Instow Burrows, invariably with yellow flowers. In specimens I received from New Brighton, Cheshire, through the Botanical Society, the flowers are all purple, and the plant appears to be of much stronger habit. Is it probable that the two plants are distinct; or are these differences merely the result of a difference of soil or situation?

Saponaria officinalis, L. Instow Burrows, close to the Barnstaple road; also by the road-side within the fence.

Saponaria officinalis, L., *flore pleno*. Near the light-house, Braunton Burrows, probably introduced.

Sagina nodosa, Mey. Northam and Braunton Burrows.

Spergularia marina, Camb. Salt-marshes on the banks of the Torridge.

Spergularia media. Southcott Marsh, near Bideford.

Radiola Millegrana, Sm. Sandy pasture of Northam Burrows.

Erodium maritimum, Sm. Sand-hills of Braunton Burrows, and sandy pasture near the pebble-ridge, Northam Burrows.

Erodium cicutarium, Sm. Braunton and Northam Burrows.

Erodium cicutarium, *album*. Braunton Burrows.

Hydrocotyle vulgaris, L. Moist parts of Northam and Braunton Burrows.

Eryngium maritimum, L. Near the pebble-ridge, Northam Burrows; Instow Burrows.

Ceanothe Lachenalii, Gmel. Moist pasture of Northam Burrows; reclaimed salt-marsh between Bideford and Instow.

Artemisia maritima, L. Banks of the Torridge, below Bideford.

Artemisia maritima, L., *β. Gallica*, Willd. Banks of the Torridge, below Bideford, growing with *A. maritima*.

Erigeron acris, L. Braunton Burrows.

Aster Tripolium, L., var. destitute of rays. Muddy banks of the Torridge, above and below Bideford. This variety also differs from the ordinary form in never growing more than from six inches to a foot in height.

Vinca major, L. Near the light-house, Braunton Burrows, but not wild.

Gentiana Amarella, L. Braunton Burrows.

Erythræa littoralis, Hook. Braunton Burrows.

Convolvulus Soldanella, L. Sand-hills near the light-house, Braunton Burrows.

Hyoscyamus niger, L. Grows from three to four feet high on the sand-hills of Braunton Burrows; Northam Burrows.

Solanum nigrum, L. Braunton and Northam Burrows.

Atropa Belladonna, L. Reported to grow at the north end of Braunton Burrows. I have never found it there.

Bartsia viscosa, L. Braunton Burrows, north-east of the light-house.

Orobanche minor, Sutt. Braunton Burrows.

Thymus Serpyllum, L. Dry pasture of Northam Burrows.

Teucrium Scordium, L. Plentiful in the moist parts of Braunton Burrows.

Marrubium vulgare, L. Braunton Burrows.

Lithospermum officinale, L. Braunton Burrows.

Lycopsis arvensis, L. Braunton Burrows.

Cynoglossum officinale, L. Braunton Burrows.

Echium vulgare, L. Braunton and Northam Burrows.

Anagallis tenella, L. Braunton and Northam Burrows.

Samolus Valerandi, L. Northam and Braunton Burrows.

Glaux maritima, L. Salt-marshes on the banks of the Taw and Torridge; Northam and Braunton Burrows.

Statice Limonium, L. Muddy banks of the river Torridge.

Statice spathulata. Raised bank, formed of agglutinated calcareous sand, at Down End, near the western extremity of Braunton Burrows.

Plantago maritima, L. East bank of the Torridge, below Bideford; Northam Burrows.

Littorella lacustris, L. Moist parts of Northam Burrows.

Chenopodium rubrum, L. Braunton Burrows.

Atriplex portulacoides, L. Muddy banks of the river Torridge.

Atriplex rosea, L. Banks of the Torridge.

Beta maritima, L. Muddy banks of the Torridge, below Bideford.

Salsola Kali, L. West bank of the Torridge, below Bideford Quay; near the light-house, Braunton Burrows, in great abundance.

Schoberia maritima, Mey. Muddy banks of the Torridge, above and below Bideford, in great abundance; banks of the Taw.

Salicornia herbacea, L. Banks of the Taw and Torridge, growing with *Schoberia maritima*.

Polygonum Raii, Bab. Sea-coast about half a mile to the north of Peppercombe.

Euphorbia Paralias, L. Sand-hills of Northam and Braunton Burrows.

Euphorbia Portlandica, L. Sand-hills of Braunton Burrows, and north end of the pebble-ridge, Northam Burrows.

Salix fusca, L. Middle of Braunton Burrows.

Spiranthes autumnalis, Reich. Dry pasture of Northam Burrows. This plant is delicately scented, like *Gymnadenia conopsea*.

Epipactis palustris, Sw. Moist spots on Braunton Burrows.

Iris foetidissima, L. Braunton Burrows, abundantly.

Juncus maritimus, Sm. Unreclaimed marsh-land on the banks of the Taw and Torridge.

Juncus acutus, L. Thirty or forty acres of Northam Burrows are covered with this plant; Braunton Burrows, &c.

Scirpus lacustris, L. Southcott Marsh.

Scirpus Holoschænus, L. Several parts of Braunton Burrows; in a valley between the sand-hills about a quarter of a mile in a direct line from the larger light-house to Baggy Point; in great abundance in a similar valley nearly a mile from the light-house, in the direction

of the village of Branton; a small patch of it also occurs about a mile to the north of the last-named locality.

Scirpus Savii, S. et M., *β. monostachys*, Hook. West bank of the Torridge, within reach of the tide, about a mile above Appledore, at the bottom of a little glen between two steep banks; sea-coast near Peppercombe; also, in considerable abundance, about half a mile from the coast by the road-side leading from Peppercombe to the village of Horn's Cross. This solitary-spiked variety is by no means unfrequent on the coast of the Bristol Channel. It grows near the sea at Lynmouth; and I have a specimen gathered by a friend, last summer, at Swansea.

Scirpus maritimus, L. Southcott Marsh; also in a salt-marsh on the west side of the Torridge, above Appledore.

Agrostis alba, L., *β. stolonifera*, L. Near the estuary, Northam Burrows.

Ammophila arundinacea, Host. Branton, Northam, and Instow Burrows.

Glyceria distans, Wahl. Salt-marsh near West-Cliff Cottage, Northam.

Festuca rubra, L. Banks of the Torridge, below Bideford.

Triticum junceum, L. East bank of the Torridge, above Instow; west bank below Bideford Quay; near the light-house, Branton Burrows.

Asplenium marinum, L. Raised bank at Down End; north side of Branton Burrows; near Hartland, &c.

The following list includes the rarer plants growing on the higher ground within a short distance of the valley of the estuary, consisting of parts of the parishes of Northam, Appledore, Bideford, Westleigh, Instow, Branton, &c. :—

Clematis Vitalba, L. On the east side of the road from Torrington to Bideford, near Wear Gifford.

Ranunculus parviflorus, L. In the first field on the left hand side of the lane leading from the Bideford and Northam road to Orchard Hill.

Aquilegia vulgaris, L. In a wood on the south side of the old Bideford and Barnstaple road, about a mile from Bideford; also in a furze-brake on the hills to the south of Northam Burrows. Certainly both these localities are distant from any house or garden.

Berberis vulgaris, L. In a hedge nearly opposite Westleigh Church, probably introduced.

Papaver hybridum, L., and *P. Argemone*, L. In an arable field leading from Westleigh to the river Torridge.

Chelidonium majus, L. Westleigh.

Corydalis lutea, DC. Reported to grow near Bideford.

Coronopus didyma, Sm. In great abundance by the road-side between Bideford and Northam; near the rope-walk on the banks of the Torridge, below Bideford.

Cochlearia Danica, L. Old walls in the village of Northam. It also occurs on Northam Burrows, but is very diminutive, and has flesh-coloured blossoms.

Cardamine impatiens, L. Side of a stream at Peppercombe, near Bideford.

Hesperis matronalis, L. North side of the lane near Fairley House, Bideford.

Brassica campestris, L. Side of a stream below Southcott, near Bideford.

Brassica Napus, L. Near Westleigh.

Reseda luteola, L. Near West-Cliff Cottage, Northam.

Viola odorata, L., *β. alba*, Bess. Runough Farm, Northam.

Viola odorata, L. With pink and variegated flowers, near Northam.

Viola hirta, L. Road-side between Instow and Bideford.

Spergularia rubra, St. Hil. Rocks by the sea-coast at Abbotsham.

Linum usitatissimum, L. On the south side of the road between Fremington and Barnstaple.

Linum angustifolium, Huds. Road-sides and borders of fields at Westleigh, Northam, Parkham, &c.

Acer campestre, L. Lane between Northam and Abbotsham.

Erodium moschatum, Sm. West side of the lane leading from Westleigh to Lower Southcott; road-side near Westleigh Church, abundantly; close to the turnpike on the road from Bideford to Northam; road-side near Glen Burren House; road-side, Torrington Common.

Oxalis stricta, L. Very common throughout the parish of Northam, in arable fields, gardens, and orchards. In many parts it is so abundant as to become a troublesome weed. Gardens on the south-west side of Bideford; between Torrington and Littleham, three or four miles from the Northam locality. The plant has all the appearance of being truly wild.

Euonymus europæus, L. New road between Bideford and Instow.
Ulex nanus, Forst., β . *Gallii*, Planch. In considerable abundance between Bideford and Torrington.

Medicago sativa, L. Hedge-bank between Instow and Fremington.
Medicago maculata, Sibth. Very abundant about Northam and Bideford.

Melilotus vulgaris, Willd. Clover-field at Northam, probably introduced amongst the clover-seed.

Trifolium scabrum, L. Between Southcott and Westleigh.

Lotus major, Scop. Westleigh.

Vicia sativa, L., β . *angustifolia*, R. Side of the lane between Southcott and Westleigh.

Vicia sylvatica, L. On the cliffs near Abbotsham this plant assumes a prostrate habit, creeping over the rocks; near Clovelly.

Pyrus communis, L. Borders of a wood on the south side of the old Bideford and Barnstaple road, about half a mile from Bideford.

Pyrus Malus, L. Common in the hedges about Northam.

Pyrus torminalis, Sm. Woods above Clovelly.

Ribes Grossularia, L. Hedges near Bideford.

Sedum Telephium, L. Hedge-bank between Torrington and Forthelsloch.

Sedum Anglicum, Huds. Rocks about Bideford, and on the sea-coast near Abbotsham.

Sedum album, L. Old walls of Southcott.

Sedum acre, L. Walls about Bideford and Northam.

Sedum reflexum, L. Old wall, Westleigh.

Sempervivum tectorum, D. Southcott Bacton.

Cotyledon Umbilicus, L. Very abundant on old stone fences about Bideford, Southcott, Westleigh, and Northam.

Saxifraga tridactylites, L. Top of a wall by the road-side between Bideford and Northam.

Cornus sanguinea, L. Hedges about Northam, &c.

Ægopodium podagraria, L. Bideford church-yard.

Fœniculum vulgare, Gærtn. Abundant by the road-side on the east bank of the Torridge, between Bideford and Southcott; hedge-rows about Northam.

Crithmum maritimum, L. Raised bank at Down End, north side of Braunton Burrows.

Pastinaca sativa, L. In great abundance in the neighbourhood of Bideford.

Anthriscus cerefolium, Hoffm. Old road between Bideford and Barnstaple.

Viburnum Opulus, L. Road-side between Instow and Fremington.

Rubia peregrina, L. Very common in the hedges about Northam.

Scabiosa columbaria, L. By the road-side between Bideford and Instow.

Tragopogon pratense, L. Road-side near the fir-plantation between Bideford and Southcott.

Helminthia echioides, Gærtn. About Southcott.

Cichorium Intybus, L. Between Bideford and Northam.

Serratula tinctoria, L. Near Southcott, close to the new Bideford and Barnstaple road.

Centaurea Scabiosa, L. Near Southcott, &c.

Senecio squalidus, L. Abundant on the south side of Bideford; old well in Meddon Street, and waste ground below the savings'-bank. The foliage of the plant gives forth a fine aromatic scent, when bruised.

Inula Conyza, DC. Hedges about Southcott, &c.

Veronica Buxbaumii, Ten. Arable fields, Northam.

Antirrhinum majus, L. Old walls about Bideford.

Antirrhinum Orontium, L. Fields near West-Cliff Cottage, Northam.

Linaria Cymbalaria, Mill. Old walls near Bideford, Southcott, &c.

Linaria spuria, Mill. Arable fields about Southcott and Westleigh.

Linaria Elatine, Mill. Fields near Bideford, Northam, Southcott, &c.

Orobanche major, L. Furze-brake on the south side of the lane a short distance above Lower Southcott; also, in the same locality, a variety of *O. major*, differing only from the usual form in the whole plant being of a delicate citron colour.

Verbena officinalis, L. Near Southcott Bacton.

Salvia verbenaca, L. By the side of the Bideford and Barnstaple road, near the Bideford turnpike.

Lycopus europæus, L. Below Southcott, near the Torridge.

Mentha rotundifolia, L. Near Wear Gifford churchyard.

Mentha viridis, L. Road-side near the turnpike, Yeo Valley, probably introduced.

Calamintha officinalis, Mœnch. Common about Northam, Bideford, &c.

Calamintha Acinos, Clairv. Arable fields between Northam and the river Torridge.

Melittis Melissopyllum, L. On the river side of the road leading from Bideford to Torrington, about a quarter of a mile from Bideford; on the east side of the road leading from Westleigh through Lower Southcott to Torrington, about half a mile to the south of where it crosses the old Bideford and Barnstaple road. It also occurs in one or two parts of the wood adjoining the road.

Leonurus Cardiaca, L. Near Nine Houses, Lower Southcott; head of the Yeo Valley;—probably introduced in both localities.

Lamium Galeobdolon, Crantz. Wood between Bideford and Torrington.

Myosotis palustris, With. Road-sides at Witham, &c.

Myosotis collina, Hoffm. Near Peppercombe.

Lithospermum arvense, L. Fields about Northam.

Symphytum officinale, L. Moist meadows up the Yeo Valley.

Anchusa sempervirens, L. Burrough Farm, Northam; and orchard near West-Cliff Cottage, Northam.

Lysimachia Nummularia, L. Near the Torridge, between Northam and Bideford.

Anagallis arvensis, L., *β. cærulea*, Aut. Pallida, and varieties with pink and white flowers, blotched with deep red. Arable field between Northam and Bideford.

Armeria maritima, Aut. Cliffs at Abbotsham, and rocks near the Torridge.

Chenopodium olidum, Curt. Top of High Street, Bideford.

Daphne Laureola, L. Thicket near the Barnstaple and Torrington road, about two miles and a half from Bideford.

Euphorbia amygdaloides, L. Near Bideford.

Quercus Robur, L., *c. sessiliflora*, Salisb. By the side of the Bideford and Torrington road, about three quarters of a mile from Bideford.

Epipactis latifolia, Sw. Near Bideford.

Narcissus biflorus, Curt. Under some trees in a meadow between Northam and Bideford.

Narcissus Pseudo-narcissus, L. In abundance near Northam.

Galanthus nivalis, L. Reported to grow near Bideford.

Ruscus aculeatus, L. In a hedge by the side of the path leading from Westleigh House to Westleigh Church.

Carex axillaris, Good. Peppercombe Glen.

Phalaris Canariensis, L. Road-side between Fremington and Instow, probably introduced.

Avena fatua, L. Arable fields in the neighbourhood of Northam.

Glyceria rigida, Sm. Old walls, Northam.

Festuca bromoides, L. Old wall, Burrough Farm, Northam; old wall, Torrington Common.

Festuca pseudo-myurus. Old walls, Torrington Common.

Hordeum pratense, Huds. Southcott, &c.

Ceterach officinarum, Willd. Old walls of Ford House, near Bideford.

Scolopendrium vulgare, Sym., *β. crispum*, Sm. Near Hartland.

γ. multifidum, Sm. Common in the neighbourhood of Bideford, &c.

δ. ramosum, Sm. Road-side near Wear Gifford. I have a specimen, gathered at Hartland, in which the frond is developed as two barren, reniform lobes.

Osmunda regalis, L. Sea-coast near Hartland; reported to grow on the bank of the Torridge, above Bideford.

GEORGE MAW.

Barrat's-Hill House, Broseley, Salop,
December 14, 1852.

NOTICES OF NEW BOOKS, &c.

'*On the Growth of Plants in Closely-glazed Cases.* By N. B. WARD, F.R.S., F.L.S., &c. Second Edition. London: John Van Voorst. 1852.'

It is with feelings of great pleasure that we welcome a second edition of Mr. Ward's interesting little volume. A period of ten years has elapsed since the publication of the first edition,—a period, alas! that argues too forcibly, too irresistably, that in this country we are not sufficiently alive to the combination of the useful and the ornamental,—a combination achieved by Mr. Ward, in the highest possible degree; for, what can be more useful, what can be more conducive to the well-being and comfort of man, than the safe transport of those plants on which, under Divine Providence, his healthful existence may be said to depend, from the country of their nativity to the country of their consumption:—and what can be more orna-

mental, what more delightful, than the introduction of those lovely vegetable forms—whose delicate tracery was designed, by the same Almighty Ruler, to adorn the humid ravines of the tropics—into our gardens, our greenhouses, and our drawing-rooms !

The second edition of Mr. Ward's work, like the first, goes into various subjects not strictly within the compass of its title, and certainly not within the province of the 'Phytologist' to criticise. Such, for instance, are the chapters intituled respectively "On the application of the closed plan in improving the condition of the poor" and "On the probable future application of the preceding facts." On these subjects we are glad to be excused from the expression of an opinion. It is far different, however, with what may be termed the practical part of the work, and especially with the chapter "On the conveyance of plants on ship-board." Here Mr. Ward is an experienced guide, dealing with facts alone ; and the results, as recorded in the Appendix, speak for themselves.

In conclusion, we have to notice with cordial approbation the neat manner in which the work has been brought out, and the extreme beauty of the illustrations, which have been supplied by Mr. E. W. Cooke and Mrs. S. H. Ward.

'*The Botany of the Malvern Hills.* By EDWIN LEES, F.L.S., &c. Second Edition, enlarged and corrected. London : Bogue, Fleet Street.' [No date ; received November, 1852].

"I come to this sweet place for quiet," is the quotation with which Mr. Lees opens the botanical arcana of this neat little *brochûre*. So, once, did we ; but quiet was not there. The little party, of which the editorial *plural* of the 'Phytologist' formed a *unit*, was persecuted by a host of itinerant venders of disgusting comestibles, fortune-tellers, donkey-drivers, and beggars. This nuisance having become intolerable, we stepped over an almost invisible fosse, much like a single plough-furrow, on to a portion of the bare hill-side which the said fosse was supposed to mark as cultivated ground. Here the assailants in the rear halted ; and we began to chuckle, very innocently, as we thought, at their discomfiture. Alas ! we had only been leaping out of the frying-pan into the fire. We soon saw a human being, of extraordinary figure and doubtful sex, shuffling towards us, with all the haste it could achieve. Arrived within earshot, it assailed

us with a volley of oaths, in the loudest and most discordant tones. We were trespassing! *We*, still the editorial *unit*, apologized: "we had no intention of trespassing; the virgin soil had never been broken; there were no traces of cultivation; *but*, as we were wrong, we would re-cross the fosse, and retire." Suiting the action to the word, we vacated the enemy's territory; but during the brief parley two athletic fellows, armed with bludgeons, had joined the party, and coarsely informed us that unless we gave them half a crown per head they would dog us all day, and take us before a magistrate as soon as we returned to our inn. We paid the fine, right glad to escape the proximity of the bludgeons of such ferocious-looking banditti. Under these circumstances, we feel entitled to advise the explorer of the Malvern Hills, on a fine day, to provide himself with sufficient pocket-money to buy off the mercantile vagrants, and also to observe very carefully where he is treading, lest he inadvertently step over an *invisible* fence, and thus commit a trespass. By strict attention to this advice and caution, he may perchance attain that "quiet" for which people visit such "sweet places." It is, however, a lamentable thing, that almost every foot of uncultivated ground worth visiting is beset by lazy and dissolute, but licensed, vagrants, who subsist on the fears or the folly of the visitors.

Having relieved our mind of these weighty matters, we dip into Mr. Lees's little volume once more; and we would venture to remark that the new arrangement, or system, which Mr. Lees has introduced does not seem to us any improvement on the usual mode. Mr. Lees explains his system in these words:—"I have distributed the plants in the three grand Natural Divisions, but subdivided them on the Linnæan plan, for convenience' sake to the memory, and to avoid the necessity of an index." Without gainsaying these merits, we may perhaps be allowed to remark that they are not self-evident. Each of the Linnean classes, Diandria, Triandria, Tetrandria, Hexandria, Octandria, Monœcia, and Dicœcia occurs twice over, an arrangement that would not, at the first blush, strike any botanist as rendering assistance to the memory.

Every local Flora is acceptable; and this, penned by a botanist who has so long resided on the spot, or in its immediate vicinity, is doubly so, because we must regard it as in a great measure complete. No one ever enjoyed the opportunity of more thoroughly investigating a locality than Mr. Lees has that of Malvern; and we give him credit for having availed himself, to the utmost, of the advantages which long residence, industry, and a taste for the subject confer. We

therefore hail the Botany of Malvern as one of the most perfect local lists of plants that has ever reached our hands ; and, as such, we cordially recommend it to our friends. With these preliminary observations, we proceed to give some lengthy extracts.

“ *Localities of Plants.*—The stranger who proposes to botanise in this district must not expect to gather all its remarkable plants in a cursory ramble on the hills. In fact, most of the rarer plants occur rather in the valleys, or about the woods at the base of the chain, than on the rocky summits themselves. But if the botanist has a few leisure weeks to dispose of, with a zest for ramble, he will find abundant scope for observation and enjoyment.

“Early in the spring, the wood-spurge throws a light green verdure about the declivities, contrasting well with dead grasses, withered brakes, and the dark tufts of yet unflowered gorse ; soon after, tufts of broom in many spots vein the hill-side with golden gleams ; and about midsummer, the fronds of the brake give a verdant cincture to the then arid masses of rock, bearded with crisp lichens. But on the rocky masses themselves much depends upon a showery season, as then minute plants are well developed, scarcely observable at any other time.

“The vegetation of this district may be traced in three divisions, accordant not only with the obvious surface-aspect of the country, but with its geological relations. The first division comprises the flat country eastward of the hills to the Severn, whose course, setting aside curvatures, is nearly parallel to the Malvern chain, the distance from the river varying in the space between Worcester and Tewkesbury from five to about seven miles. The whole of this plain consists of red marl, with deposits of diluvial gravel in various places, close to or within short distances of the river. To the south of Upton, several isolated hills of lias limestone occur ; and north of that town various tabular or roof-shaped hills of red marl, more or less covered with wood, run parallel with the Severn, and beautifully diversify the scene. Even nearer the hills, especially southwards, many fortress-like eminences start up in a picturesque manner, and, robed with foliage, greatly relieve the tame flat that would otherwise present itself.

“Yet the wide green commons that stretch around the hills eastward, belted in by woodlands and ever verdant, have a peculiar and pleasing character under varying atmospherical influences, when in a summer afternoon the great mountain shadow covers them in gloom, slowly impinging upon and lessening the farther landscape’s brightness ; and, pictorially, it must be regretted that such recent innova-

tions have been made upon the extensive waste of Welland Common, that, for some time to come, that part of the country must assume the appearance of a surveyor's map.

"The drainage of the whole district is received by the Severn, even from the Silurian limestone on the western side of the ridge ; for the river Ledden, that, flowing past Ledbury, collects the streams from the southward, after a farther course of ten or twelve miles, flows into the Severn at Gloucester. Throughout the whole eastern plain no lake or even pool of any striking dimensions occurs ; but the streams that flow from the hills in the direction of Eldersfield, the Berrow, and Longdon, being precluded from reaching the Severn directly by the intervention of steep banks of marl, and having only one outlet to that river with scarcely any fall, necessarily accumulate in the flat meadows, forming *marshes* of considerable extent, and entirely overflowed in the autumnal season. Many efforts have been made to drain these marshes, and deep ditches beset them on every side ; but, having only one sluggish outlet, and being, in fact, in many places below the level of the bed of the Severn, it appears impracticable to provide an adequate drainage for them. Thus these marshes present a curious appearance, hemmed in on all sides by land in the highest state of cultivation, which is continually impinging upon them. Longdon Marsh well deserves a visit to its margin, which should be made by way of Castle Morton ; and the following rare or local plants which grow about, or in the wide watery ditches there, will well repay the trouble : *Hippuris vulgaris*, very plentiful ; *Scirpus maritimus*, on the eastern side ; *Lysimachia vulgaris*, *Lonicera Xylosteum*, on the Longdon side, by a lane leading to the northern end of the marsh ; *Apium graveolens*, *Œnanthe peucedanifolia*, *Œ. Lachenalii*, *Triglochin palustre*, *Rumex maritimus*, *Butomus umbellatus*, *Rosa spinosissima*. In the marshy flat meadows at the end of the lane leading down from Castle Morton may be observed, before the mowing of the grass, *Lathyrus palustris* ; the pretty *Cnicus pratensis*, rather plentiful ; *Senecio aquaticus*, *Orchis latifolia*, *Habenaria viridis*, *Carex intermedia*, *distans*, and many others.

"The extensive commons of Welland, Castle Morton, Barnard's Green, &c., have many plants that are localised there only, as *Bupleurum tenuissimum*, *Helosciadium inundatum*, *Petroselinum segetum*, *Myosurus minimus*, *Polygonum minus*, *Tormentilla reptans*, *Mentha piperita*, *Nasturtium terrestre*, *Pulicaria vulgaris*, and *Anthemis nobilis*.

"The second division will comprehend the hills themselves and their immediate roots ; while the third comprises the calcareous

‘Silurian’ country westward of the hills. Cowleigh Park, at the northern end of the chain, and including in its wild boundary several syenitic spurs, well deserves examination. Here grow *Rosa tomentosa*, *R. villosa*, *Rubus Bellardi*, *R. pallidus*, *fuscus*, and *Schlectendalii*, *R. echinatus*, *Lepidium Smithii*, and a variegated-leaved variety of *Quercus sessiliflora*. Beyond Cowleigh Park the dense covert of Rough Hill Wood offers itself to tempt the onward foot of the explorer; and in the moist meadows between that eminence and Leigh Sinton, *Hypericum Androsæmum*, *Gymnadenia conopsea*, and *Habenaria viridis*, may be gathered. The Old Storage Hill lies in this direction, and the brook that enters its secluded recesses presents many scenes of wood and water delightful both to the contemplative and botanical eye.

“The rocks of the hills themselves have some plants that mostly flourish only there, such as *Galium saxatile*, *Plantago Coronopus*, *Hyoscyamus niger* (Hereford Beacon), *Helosciadium repens*, *Arenaria rubra*, *Cotyledon Umbilicus*, *Sedum album* (North Hill), *S. Telephium*, *Spergula nodosa*, *Potentilla argentea* and *verna*, *Orobanche major*, *Corydalis claviculata*, *Erodium maritimum* (North Hill), *Gnaphalium sylvaticum* (End Hill), and of course most of the Ferns. The Hollybush Hill, with the ravine called ‘The Gullet,’ between it and the Warren Hill, should, if possible, be examined; and in the bogs, which occur at the *western bases* of the hills, will be found the beautiful *Eriophora*, *Pinguicula vulgaris*, *Anagallis tenella*, the fly-ensnaring sundew, and a plentiful supply of *Carices*.

“The natural crest of the Ridgeway in Eastnor Park, splendidly wooded as it is on either side, with the grand Camp Hill towering above, is invested with interest to both geologist and botanist. Gloomy yews, of indigenous growth, in some places shadow the road; in others, the glaucous-green juniper adorns the scene; the *Polygala* shows its varying flowers of blue, pink, or white; and *Chlora perfoliata*, *Habenaria chlorantha*, *Bromus erectus*, and *Avena pubescens*, flourish on the rocky soil most luxuriantly.

“Many delightful rambles may be made in the woods on the *western side* of the hills, or about the limestone quarries; the ‘Croft,’ in particular, towards Mathon, is a good locality. Most of the following plants may be gathered in this vicinity, being confined to the calcareous strata. *Viola hirta*, *Gentiana Amarella*, *Pimpinella magna* (Cradley and Suckley), *Chlora perfoliata*, *Chrysosplenium alternifolium*, *Aquilegia vulgaris*, *Linaria minor*, *Anthyllis Vulneraria*, *Vicia sylvatica*, *Cnicus eriophorus*, *Orchis pyramidalis*, *Habenaria chloran-*

tha, *Ophrys apifera*, *Listera Nidus-avis*, and *Epipactis latifolia*. Wood lyme grass (*Elymus Europæus*) is also peculiar to the western woods.

“Purlieu Lane, and some other hollow ways about Mathon and Cradley, still exhibit the old country characteristic of the roadway and the water-course existing in conjunction; and in such deep recesses *Lathræa squamaria* and other shy plants delight to hide from the glare of daylight. Here the wanderer finds himself deep in the soil, and almost floating with the stream, while thick masses of verdure, from pollard oaks and battered hollies, overspread the twilight scene; and old boles and mossy roots are covered with the untouched hoary mould of centuries, or inscribed with the curious characters the *lirellæ* of *Opegrapha lyncea* or *Graphis scripta* form in such places.

“It has been remarked that more plants occur here varying with *white* flowers than is usual in other places; and I have observed the following plants thus sportively circumstanced: *Veronica officinalis*, *Scabiosa succisa*, *Erythræa Centaureum*, *Campanula Trachelium*, *Anagallis tenella*, *Agraphis nutans*, *Calluna vulgaris*, *Aquilegia vulgaris*, *Ajuga reptans*, *Betonica officinalis*, *Prunella vulgaris*, *Pedicularis sylvatica*, *Digitalis purpurea*, *Vicia sepium*, *Ballota fœtida*, *Bartisia Odontites*, *Antirrhinum majus*, *Polygala vulgaris*, *Ononis arvensis*, *Carduus nutans*, *C. palustris*, *Orchis pyramidalis*, and *O. mascula*.

“The following plants have either become very recently denizens of the Malvern district, or have been previously unrecorded in the localities where they now appear: *Veronica Buxbaumii*, *Echium vulgare*, *Erythræa pulchella*, *Oenanthe Lachenalii*, *Sium angustifolium*, *Bupleurum rotundifolium*, *Rumex pulcher*, *Epilobium virgatum*, *Polygonum mite*, *Geum intermedium*, *Scrophularia Ehrharti*, *Orobanche minor*, *Limosella aquatica*, *Lepidium Draba*, *Barbarea præcox*, *Geranium striatum*, *Orobis tenuifolius*, *Lathyrus Aphaca*, *Lactuca Scariola*, *Hieracium umbellatum*, *Callitriche pedunculata*, *Myriophyllum alterniflorum*, *Salix acuminata*, *Juncus obtusiflorus*, *Alopecurus fulvus*, *Avena pubescens*, *Lolium multiflorum*, and *Potamogeton prælongus*.

“More than half the plants occupying the Malvern Hills are Cryptogamic, as will be seen by the following enumeration, which includes the productions not only of the syenitic ridges themselves, but of the country eastward to the Severn, northward to the Teme, southward to Redmarley on the Ledden, and westward to the Silurian heights parallel with Ledbury. Undoubtedly considerable additions may yet be made to the Algæ and Fungi; for I have not been able to give much attention to the Algæ Confervoidæ, nor have I taken but very

little note of the minuter species of *Sphæria*, &c. among the Fungi; but I have recorded nevertheless all the really tangible and decided forms that have fallen under my observation (independent of minute microscopical examination) during a period of twenty years.

ENUMERATION.

PHANEROGAMIC VEGETATION.	{	Dicotyledonous plants	625	
	{	Monocotyledonous plants	177	
		Total Phanerogamic	802	
CRYPTOGAMIC VEGETATION.	{	Ferns and Equisetaceæ	24	
	{	Mosses	145	
	{	Jungermannia	28	
	{	Other Hepaticæ, Characeæ, &c.	28	
	{	Lichens	254	
		Fungi	398	
		Total Cryptogamic	877	
Entire number of Malvern plants			1679	

“Thus in a small tract of country, sixteen miles in length and about eight or ten in breadth, nearly seventeen hundred species of plants are found, without including minor mycological productions.”

PROCEEDINGS OF SOCIETIES, &c.

BOTANICAL SOCIETY OF LONDON.

Monday, November 29, 1852. (Sixteenth Anniversary Meeting).
—Dr. John Edward Gray, F.R.S., President, in the chair.

Mr. G. E. Dennes, the Secretary, read the Report of the Council; from which it appeared that 14 new members had been elected since the last Anniversary Meeting, and that the Society now consisted of 302 members. Many thousands of specimens of British and foreign plants had been distributed to members, and numerous continental botanists; and increased exertions had been made, this year, to render this important department of the Society's operations more efficient; and, already, numerous valuable specimens had been received for distribution to the members early in the ensuing year. The Report was unanimously adopted. A ballot then took place for the President and Council for the ensuing year, when the President was re-elected; and he nominated John Miers, Esq., F.R.S., and Arthur Henfrey, Esq., F.R.S., Vice-Presidents.

John Ball, Esq., M.P., F. P. Pascoe, Esq., F.L.S., and J. T. Syme, Esq., were elected new members of the Council, in the room of Dr. Palmer, J. Coppin, Esq., M.A., and J. Woollett, Esq. The Treasurer, Secretary, and Librarian were re-elected.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, December 9, 1852.—Professor Balfour, V.P., in the chair.

The following gentlemen were elected office-bearers for the ensuing year:—President: Professor Balfour. Vice-Presidents: Professor Christison, Professor Fleming, Major Madden, and Dr. Seller. Council: Mr. James Cunningham, W.S., Mr. Charles Jenner, Mr. Henry Paul, Mr. John M'Laren, Mr. James M'Nab, Dr. Parnell, Dr. Lauder Lindsay, Dr. Dobie, Mr. John Matthews, and Mr. George S. Blackie. Honorary Secretary: Dr. Greville. Foreign Secretary: Dr. Douglas Maclagan. Auditor: Mr. Brand. Treasurer: Mr. Evans. Curator of Museum: Mr. Thomas Anderson. Assistant Secretary and Curator: Mr. G. Lawson.

The following donations were announced to the Society's library and herbarium:—From Mr. Henfrey,—his paper on the Structure of the Stem of the *Victoria regia*; from Mr. Paul,—Exchange Lists of the Christiania Botanic Garden, and a packet of Norwegian Plants; from Mr. T. Moore, Chelsea Botanic Garden,—his List of British Ferns, adapted as Labels for the Herbarium; and from the Smithsonian Institution, Washington, U.S.,—the following publications:—‘Fourth and Fifth Annual Reports of the Board of Regents of the Smithsonian Institution,’ ‘Programme of Organization of the same,’ ‘Registry of Periodical Phenomena,’ ‘List of Works published by the Smithsonian Institution,’ ‘List of Foreign Institutions with which the Smithsonian Institution is in Correspondence,’ ‘Abstract of the Census of the United States,’ ‘Directions for Collecting Specimens of Natural History,’ ‘Notice of the Origin, Progress, and Present Condition of the Academy of Natural Sciences of Philadelphia,’ by J. W. Ruschenberger, M.D., Surgeon U.S. Navy, ‘Reports from the Commission of Scientific Inventions, in relation to Sugar and Hydrometers, made under the superintendence of Professor A. D. Bachey,’ by Professor R. S. M'Culloch, ‘Report of the Commissioners for Patents, for the year 1852,’ Part II., Agriculture.

Professor Balfour exhibited the following donations, made to the Museum of Economic Botany at the Royal Botanic Garden, since the last meeting of the Botanical Society, *viz.*:—From Professor Simpson: Three specimens of the fruit of a species of sago palm (*Sagus*), from Calabar. From Professor Christison: Specimens of poison-nuts, from Calabar, apparently the seeds of a Leguminous plant. In exhibiting these to the meeting, Dr. Balfour took occasion to mention that the seeds produce effects similar in many respects to poisoning with aconite. He stated that Dr. Christison had swallowed about a quarter of a seed; and it had produced alarming symptoms, such as depression of the heart's action, and intermission of the pulse, requiring the use of ammoniacal stimulants. From Sir Walter C. Trevelyan, Bart.: A collection of fruits and seeds, consisting of 2973 species and varieties. From Henry Paul, Esq.: A bowl, with chain and ladle, from Christiania, all connected together, and cut from one piece of wood, without joining. From Dr. Greville: A specimen of *Trentepohlia pulchella*, from Craven, Yorkshire, spreading over a stone between three and four inches in diameter, and giving to it a fine purple covering on one side.

Dr. Balfour laid on the table two numbers of a new German periodical, entitled 'Bonplandia,' to be published twice a month, under the editorship of Messrs. Seemann and Rumpler.

Mr. A. Bryson exhibited a beautiful polished pedestal, having the appearance of a solid block of black marble, made from the stem of the gru-gru palm (*Acrocomia sclerocarpa*); also a circular ottoman, made from the stem of the mountain cabbage palm (*Euterpe montana*).

Alpine British Plants, particularly Hieracia.

Dr. Balfour exhibited a series of alpine specimens, transmitted by Mr. Backhouse, including three species of *Polygala*, *Myosotis suaveolens* (from Yorkshire), *Polypodium alpestre* (from several localities), and a series of Clova and Braemar *Hieracia*. The latter included nearly every alpine form found among the mountains of that district. Mr. Backhouse states that in adopting five or six new names for those of the *H. alpinum* group, &c., it is not with a strong belief that all these are distinct species, but because for the present they give distinction to the distinct forms occurring among the mountains. Mr. Backhouse hopes ere long to be able to write a paper minutely describing these, and in such a manner as to enable persons to identify each form, or species, in that district at least. In mentioning forms, he alludes, of course, to the apparently permanent forms which may

prove true species. Mr. Backhouse thinks that *H. chrysanthum*, *H. globosum*, *H. alpestre*, and *H. argenteum* will prove to be good species, but that there is some doubt regarding *H. affine*, *H. gracilentum*, and *H. insigne*. Some of those near *H. alpinum* look more distinct when growing than when pressed; and the cultivated examples of *H. alpinum* and *H. melanocephalum* go far to confirm the view that they are distinct species. Considerable importance, he thinks, may be attached to the colour of the style. Of the whole *Hieracia* (fifty or sixty) Mr. Backhouse has growing specimens, carefully named and numbered; and he means to record the results of cultivation. The following is a list of the specimens shown:—

Hieracium tridentatum. One mile below Clova, Forfarshire; July, 1852. Styles yellow; ligules glabrous.

H. Lawsoni. Winch Bridge, Teesdale; June, 1852.

H. pallescens (*H. scapigerum*, Fries). Falcon Clints, Teesdale; June. Styles yellow; ligules glabrous.

H. alpinum. Stem never branching; cultivated several years. Styles always pure yellow. Does not flower twice a year.

H. alpinum. Lochnagar, Aberdeenshire; July. Granite. Styles yellow; ligules strongly ciliated; outer scales blunt and subfoliaceous, inner linear, attenuate.

H. alpinum. Canlochon Glen, Forfarshire; July. Styles yellow; ligules strongly ciliated; outer scales blunt.

H. chrysanthum, Backhouse. Cultivated two years. Roots from Scotland. Styles and florets golden yellow, very handsome.

H. chrysanthum, Backhouse, var. *H. rupestre*, Bab. Man. Cairntoul, Aberdeenshire; August. Styles and florets golden yellow; ligules slightly ciliated.

H. chrysanthum, Backhouse. Falls of the Feula, Glen Dole, Clova mountains, Forfarshire; July. Mica. Styles and florets deep golden yellow; ligules slightly ciliated.

H. rupestre, Bab., seems to be a pale, luxuriant variety of this plant. The above is branched when strong.

H. cæsium, Fries. Craig Wharral, Clova mountains, Forfarshire. Mica. Styles livid; ligules glabrous. July, 1852.

H. nigrescens, Fries. Cairntoul, Aberdeenshire; July. Granite. Styles fuliginose; ligules ciliated.

H. nigrescens, Fries. Corrie of Clova, Forfarshire; July. Mica. Typical form. Styles fuliginose, &c.

H. nigrescens, Fries. Ravine of the White Water, Clova mountains, Forfarshire; July. Mica. Heads typical; styles fuliginose;

ligules ciliated; inner involucreal scales bluntish, and tipped with white pubescence.

H. nigrescens, var. Ravine of the White Water, Clova mountains, Forfarshire; July. Styles livid; ligules ciliated.

H. nigrescens, Fries. Craig Wharral, Clova mountains; July. Mica. Styles darkly fuliginose; ligules ciliated.

H. gracilentum, Backhouse, Alpine var. *H. melanocephalum* and *H. gracilentum*, Fries. Canlochen Glen, Forfarshire; July, 1852. Porphyry.

H. insigne, Backhouse. Loch Ceanndin, Aberdeenshire; August, 1852. Styles yellow; ligules ciliated; flower usually very large.

H. affine, Backhouse. Near Loch Aan, Cairngorum mountains, Aberdeenshire; July, 1852. Granite. Styles yellow; ligules ciliated; involucreal scales all linear, attenuate, acute.

H. alpestre, Backhouse. Ben-na-Bourd, Aberdeenshire; August. Granite (3000 to 3500 feet). Styles yellow; ligules coarsely but not densely ciliated; inner scales acuminate, involucre broad-based.

H. melanocephalum, var. *H. latifolium*, Backhouse. Corrie of Clova, Forfarshire; September, 1852. Mica (2500 feet). Styles livid; ligules strongly ciliated.

H. melanocephalum, var. *H. latifolium*, Backhouse. Lochnagar, Aberdeenshire; August. Granite (3000 to 3500 feet). Styles livid; ligules strongly ciliated.

H. melanocephalum, Backhouse. Second flowering in 1852. Cultivated two years. Roots from Scotland. Styles livid.

H. melanocephalum, Backhouse. Cultivated two years. First flowering in 1845. Root from Scotland. Styles livid.

H. melanocephalum. Craig Maid, Clova mountains, Forfarshire; July, 1852. Styles livid, more toothed in leaves when on harder rock or mica.

H. melanocephalum. Entire-leaved form. Craig Wharral, Clova mountains, Forfarshire; July, 1852. Mica. Styles livid.

H. corymbosum, Fries. Clova, Forfarshire; July, 1852. On heathy hillocks.

H. Norvegicum, Fries. Clova, Forfarshire; July, 1852. On heathy hillocks. Styles yellow.

H. argenteum, Fries. "Crag Chuloch," Aberdeenshire; August. Granite. Styles yellow.

H. argenteum, Fries. Kilbo Corrie, Clova mountains; July, 1852. Mica (2000 to 2500 feet). Styles yellow; ligules ciliated.

H. argenteum, Fries. Clova, Forfarshire; July. On heathy

hillocks. Involucral scales narrower than in my specimens from the south of Norway, and from Braemar, exactly resembling others from Nordland. Styles yellow.

Hieracium, sp.? Cairntoul, Aberdeenshire; July. Granite. Whole plant intensely glabrous, when fresh.

H. Anglicum, Fries. Canlochen Glen, Forfarshire; July. Styles livid; ligules ciliated.

H. Anglicum, Fries. Ravine of the White Water, Clova mountains, Forfarshire; July. Styles livid; ligules ciliated.

H. globosum, Backhouse. Cairntoul; July, 1852. Granite. Styles yellow; ligules ciliated, sometimes nearly glabrous, inner scales appressed, whole plant cæsious.

H. Saxifragum, var. *H. vimineum*, Fries. Ravine of the White Water, Clova mountains; July. Styles livid.

H. Saxifragum, var. *H. vimineum*, Fries. Craig Wharral, Clova mountains; July. Mica. Styles livid; ligules slightly ciliated.

H. Saxifragum, var. *H. vimineum*, Fries. Cairntoul, Aberdeenshire; July, 1852. Granite. Styles livid; ligules slightly ciliated. Unusually large for Scotland, but more typical.

H. cerinthoides, Bab. and Don. Kilbo Corrie, Clova mountains, Forfarshire; July, 1852. Mica. Styles livid; ligules shortly ciliated.

H. cerinthoides, Bab. Cultivated two years. Root from Scotland.

H. Iricum. Castletown of Braemar, Aberdeenshire; July. Styles livid; ligules glabrous.

H. Iricum. Cultivated root from Teesdale.

Gnaphalium Norvegicum. Lochnagar, Aberdeenshire.

Polygala uliginosa, Reich. High moors of Teesdale, rare; July, 1852. Discovered in spring, 1852. Root-leaves large, fleshy, bluntly ovate, with diverging veins; flowers small. The veins or nerves of the alæ never anastomose.

Polygala vulgaris. Teesdale; July, 1852. Plant insipid, erect, or ascending from a central tuft, rarely branching when compared with depressa; alæ elliptical, pointing forward, nerves slightly anastomosing; flowers numerous.

Polygala vulgaris. Heslington Fields, near York; July.

Myosotis suaveolens. High limestone ridges of Micklefell and Littlefell, Yorkshire; July, 1852. First found on Micklefell, in the spring of 1852.

Polypodium alpestre, Koch. Glen Fiadh, Clova mountains, Forfarshire; July, 1852.

Polypodium alpestre, var. Glen Isla ; July, 1852.

Polypodium alpestre. Cairntoul, Aberdeenshire ; July, 1852.

Pseudathyrium alpestre.

Dr. Balfour made some observations on the *Polypodium rhæticum*, Vill. (Voyage Botan. p. 12), *Polypodium alpestre*, Hoppe, *Pseudathyrium alpestre*, Newm. He stated that a good specimen of the plant is found in Mougeot and Nestler's 'Stirpes Cryptogamiæ Vogeso-Rhenanæ,' No. 602. The plant is said to grow in "Summis Vogesorum præruptis herbidis." It is stated by Mr. H. C. Watson to have been gathered by him in the great corrie of Ben Alder, on the west side of Loch Ericht, Inverness-shire ; also, in 1844, in Canlochen Glen. The plant resembles *Athyrium Filix-fœmina* so much as to have been passed over by many botanists ; and it had been put by Mr. Watson among his specimens of that species. It has been found of late, by several botanists, in the Highlands of Scotland, especially in the Clova and Braemar district. On looking over the plants in his herbarium, Dr. Balfour found that it had been gathered on several occasions by himself and others, and put along with specimens of *Athyrium Filix-fœmina*, as a variety of that species. Dr. Balfour exhibited, from his herbarium, the following specimens of the plant, which had also been carefully examined by Dr. Greville :—

1. From Ben Hope, Sutherlandshire ; August, 1827. Dr. Balfour.
2. Same station ; August, 1833. Dr. Graham.
3. Glen Callater ; August, 1836. Dr. Gilbert M'Nab.
4. Caenlochen, Glen Isla ; August 6, 1840. Dr. Balfour.

Distribution of Plants in Madeira.

'Remarks on the Distribution of Plants in Madeira ;' by John M'Laren, Esq.

Mr. M'Laren made some observations on the distribution of plants in Madeira, as compared with the Flora of neighbouring countries. He remarked that the vegetation of Madeira might be said to consist of two distinct Floras. One of these had a great analogy to the Flora of Algiers and the South of Spain, and contained many species common to these countries, and to the shores of the Canaries and Western Isles. This might be described as the Flora of the cultivated region. It included the naturalized trees and shrubs of the south of Europe, and most of the agricultural and littoral weeds which, from their identity with European and North-African species, were supposed to have been introduced by the agency of man, or by other natural

means. A few lowland species, not yet known as inhabitants of the Mediterranean shores, but which belong to Mediterranean genera, and do not claim affinity with the native Flora of the Atlantic Islands, he also includes in the Flora of the cultivated region. He next adverted to the native Flora of the island, which, he said, was identical in character with that of the interior of the Canary Islands and the Azores. It was well marked by the predominance of ferns, both in respect of the number of species and the fertility of individual life. Laurels and evergreen trees, with the arborescent heath, characterize the mountain scenery, and give their name to the island, Madeira signifying the land of woods. Compositæ, Ericaceæ, Labiataë, and Cruciferaë are represented by more than the usual proportion of species; Gramineæ and Leguminosæ hold an average place; and there is a remarkable deficiency in species of Rosaceæ and Cyperaceæ.

Mr. M'Laren gave a table showing the proportion of species in the different natural orders, for the two phyto-geographic regions here indicated, and entered into some details, to show the relations of these regions to the Flora of the Mediterranean and the Atlantic Islands respectively. The paper was illustrated by specimens collected last winter, during his residence in Madeira and Teneriffe.

Structure of Pentas carnea.

The President communicated a paper from Mr. Oliver, of Newcastle, intituled 'On certain Structures observed in *Pentas carnea*, Benth.'

This plant furnishes an instance of an interesting form of cellular tissue; it also presents singular interpetiolar processes, which seem to be of a glandular nature.

Mr. Oliver remarks:—"I have lately been engaged in a rather cursory microscopic examination of these objects, and believe that a brief notice of them may be interesting. Those interested in cell-multiplication, the relation of the primordial utricle to the secondary deposits of the outer cell-membrane, and the nature of such deposits, will find this plant, if I am not much mistaken, a useful addition to their means of prosecuting such inquiries.

"The regular, gamopetalous, tubular corolla of *Pentas carnea* is about one inch in length at the time of flowering.

"Surrounding the throat of the tube, and to about one-fourth the distance down it, to the base of the attachment of the short, free filaments with the tissue of the corolla, is a dense collection of unicellular hairs directed upwards. These hairs are slightly broader about

the middle of their length, tapering, with, sometimes, a rather undulating outline, to the distal extremity, and a little narrowed towards the base.

“Scattered in the lower portion of the corolline tube, are hairs of a different structure, consisting of a single series of several cells. These narrow from the base to the apex, and are similar in form and structure to the hairs of the petioles of the leaves, and interpetiolar processes, which I shall shortly notice.

“The corolline hairs are remarkable, from their fibro-cellular character. The nature of the spiral fibrous deposit is, however, difficult to determine. A first glance, with a magnifying power of perhaps 200 or 300 diameters, discovers the appearance of a narrow fibre, winding, in a spiral direction, up the inner wall of the cell, ascending to the right (as seen from its axis), and closely applied to the apparent outer cell-membrane, which has become in part absorbed. Numerous elongated and narrow slits, or line-like markings, occur throughout the spiral; but whether they are openings between the edges of an individual thread, or series of fibres, or analogous to the dots and slits of broken vascular tissue, it is not very easy to pronounce.

“When examined in fluid, this fibrous deposit has the appearance either of a coil of irregular breadth, or of a plexus or branching arrangement of fibre; between the threads of which, a line of division is perceptible. If a dried hair be placed under the microscope, we see but slits, narrow and rounded at the extremities, in the direction of the spiral ascent. These are probably an altered condition of the exceedingly fine separating lines which we discover in the fresh state. The portions of fibrous matter intervening between these openings is of very irregular breadth. The threads of the fibre vary, from the 1-6000th to 1-9000th of an inch, in breadth. After observation with my highest magnifying power, one of Powell & Lealand’s excellent quarter-inch objectives, I am not prepared certainly to describe the true condition and arrangement of this secondary spiral deposit.

“In a hair of the young corolla (the latter about the 1-6th of an inch in length), I observed the spiral arrangement pretty distinctly. In the younger stages, the cuticle does not appear to have become absorbed to such an extent as in the matured cell, a double wall being perceptible towards the extremity of the hair.

“The primordial utricle is readily separated from the cell-wall by the application of reagents. A solution of chloride of calcium, a fluid frequently useful in mounting vegetable dissections, produces this effect

after a brief interval, the utricle becoming either almost destroyed or a mere thread lying in the cells.

"I have thought that I may have observed an alteration in the fibrous deposit connected with the irregularly-distributed convexities of the cell-wall, and which gives rise to the frequently somewhat sinuous outline of the hair; but I cannot certainly mention an instance. The spiral fibre, if such it be, is quite incapable of unrolling, at least in the cases which I have examined; and the wall of the hair tears in a manner almost totally irrespective of its direction.

"Series of spiral vessels, sometimes branching, are met with in the corolla; but I do not discover any direct communication between these vessels and the spiral cells.

"I have not detected any movement of the cell-sap in this tissue; merely, at times, a slight molecular motion.

"With regard to the multicellular hairs, these are readily obtained from any portion of the young exposed plant; but the curious filiform processes from the petiolar sheath, furnish them, without trouble, in a condition easily prepared for examination.

"The hairs consist of a variable number of cells, sometimes as many as nineteen, applied by their extremities. They almost invariably present more or less the appearance of dots, or rather slits, generally in a direction somewhat parallel with the axis of the hair, but sometimes also slightly inclined in a spiral (as in the unicellular hairs of the corolla), ascending to the right, as viewed from the centre. The edge of the lower portion of these hairs sometimes presents an almost even outline; but frequently (and perhaps nearly always toward the extremity of the hair) a slight, irregular beading occurs, exactly as we might expect were the dots or markings occasioned by external matter; but I am not sure that this appearance is incompatible with the idea that they may be openings, or slits, in a secondary deposit on the common wall of the hair, which, from an examination solely of the markings in the central portions, we might conclude they were. I have not detected, in these hairs, actual motion of the cell-sap; but mucilaginous threads may be easily seen, radiating irregularly from the nuclear vesicle, indicating such a circulation. With regard to the contents of the nucleus, I cannot certainly speak. Sulphuric acid, diluted, causes the primordial utricle to contract, and lie in the interior, as a loose sac. In some small cells, the separation is not apparent after twenty-four hour's action.

"A solution of chloride of calcium causes a partial dissolution of the primordial utricle, certain bodies, perhaps including the true nucleus, remaining visible.

“The epidermis of the interveinal spaces of the under side of the leaf, consists of cells with a sinuous boundary, numerous stomata, formed by two crescentic cells, applied by their extremities, being scattered about.

“Acicular raphides are of frequent occurrence; they abound also in the glandular stipules found between the petioles of the opposite leaves.

“The application of pressure causes the escape of very numerous raphides, together with a peculiar, thick fluid. In some instances this substance has a vermiform appearance, when forced out of the enclosing sac, owing to its having been exuded, I suppose, through a small orifice.”

Mr. Oliver then gave a description of the stipulary glands, similar to what has already been given by Weddell and others, in the case of the Cichonaceæ.

Drawings, and specimens under the microscope, were shown, in illustration of Mr. Oliver's remarks.

The following gentlemen were elected Fellows of the Society, viz. :—John Stuart Blackie, Esq., Professor of Greek in the University of Edinburgh; Alexander Cowan, jun., Esq., 30, Royal Terrace; and William John Menzies, Esq., Murrayfield House.

The Society then adjourned till the second Thursday of January.

MICROSCOPICAL SOCIETY OF LONDON.

June 23, 1852.—Geo. Jackson, Esq., in the chair.

A paper by Professor Williamson, entitled, ‘Further Contributions to the Structure of *Volvox globator*,’ was read.

The author's views with respect to the cellular nature of certain appearances in *Volvox globator*, as detailed by him in the ‘Transactions of the Philosophical Society of Manchester,’ having been controverted by Mr. Busk, in a paper lately read to this Society, and as subsequent researches have, in Mr. Williamson's opinion, confirmed his former statements as to the cellular structure of that organism, he considered it necessary to lay before the Society the present paper, containing some account of the observations by which he considers he has established the correctness of his former assertions. The object of the paper was therefore to adduce proofs, not of the vegetable nature of *Volvox globator*, for on that point both of these

gentlemen agree, but of the cellular nature of certain appearances in that body. The author described the hexagonal cells which form a peripheral stratum in the Volvox as being exceedingly difficult to detect in the living organism, and gave an account of their various appearances under different circumstances, stating, also, that difference of locality alone is sufficient to produce very varied appearances, as well as difference in the time of the year. The radiating threads which connect the cells were described at great length, and minutely detailed; and the conclusion arrived at was, that these threads consist partly of the ductile mucilaginous membrane of the protoplasm, and partly of its contents, the latter being present in various proportions. He also instituted a comparison between the cells in certain ulvaceous plants and those of Volvox, and stated that he considered the vesicles of the latter to be of precisely the same character as those of the former, and consequently that they are, in every sense of the word, real cells. The author next investigated the origin of the superficial pellicle of Volvox, which he considers as formed by the consolidation of the cell-walls, and then proceeded to endeavour to determine the relative periods at which the cells, the superficial pellicle, and the cilia are developed, and expressed his opinion that the cilia are the first to make their appearance, the cells and outer pellicle being subsequent growths. The nature of the fluid within the Volvox formed the next subject for discussion. This he considers not to be water, but, apparently, mucilage. The author then pointed out the close analogy that exists in the development of Volvox globator and that exhibited by many of the lower Algæ and Confervæ, and concluded by expressing his opinion that every fact brought to light by this inquiry tended to confirm his previous conclusions, *viz.*, that the affinities of the Volvox are with the vegetable rather than with the animal kingdom.

THE PHYTOLOGIST CLUB.

One Hundred and Fortieth Sitting.—Monday, December 27, 1852.

—MR. NEWMAN, President, in the chair.

Suminski's Theory of the Reproduction of Ferns.

The President made the following observations on this subject:—

“Mr. Henry Deane, of Clapham Common, so well known for the extent and accuracy of his microscopical observations, has been

engaged in examining the so-called reproductive organs of ferns, with a view to confirm or disprove the remarkable statements of Suminski, first made known to the botanical public through the pages of the 'Phytologist.' The result will be published when the observations shall be completed. In the mean time, it seems desirable to state, as a negative result of great importance, that Suminski is certainly in error in supposing that the first gyrate frond is *necessarily* dependent on the impregnation of an ovule contained in the archegonium. Whether such impregnation ever takes place, or whether it takes place in *Pteris serrulata*, the species on which the experiments of Suminski were made, remains yet to be proved; but, if it can be shown that such impregnation is not essential to the production of the gyrate frond, it follows that it is no law of Nature. It is quite evident that the gyrate frond *occasionally* originates in the disk of the proembryo, as asserted by Suminski to be the case in *Pteris serrulata*; but even in such instances the origin of the gyrate frond and the impregnation of the supposed ovule are not necessarily connected. In *Adiantum Capillus-Veneris* a totally different phenomenon is observable: in this species a portion of the margin of the proembryo—generally the portion most distant from its point of attachment to the soil—protrudes itself, and elongates into a lobe, the mesial line of which becomes gradually more thickened, and more opaque; and this thickened and opaque line eventually proves to be the incipient state of the stipes, or mesial rachis, of the future gyrate frond, which is thus evidently a prolongation of the proembryo itself. Gradually, but very perceptibly, the elongation of the lobe continues, until it becomes almost entirely absorbed into the mesial opaque line, and until its extremity curls over, and assumes a distinctly circinate character. These facts may be confirmed by every microscopist; and their tendency to overthrow Suminski's hypothesis will be admitted by all."

Asplenium fontanum in Hampshire.

The President read the following note, from Mr. W. H. Hawker, dated Ashfield Lodge, Petersfield, Hants, December 23, 1852:—

"I have been so fortunate as to discover the above fern, whose claims to be a true native have been lately so much questioned. I trust that the circumstances under which I have found it existing, may tend to restore it to its forfeited place in the British Flora. It is growing abundantly and luxuriantly, for I counted twelve tufts of it the last time I went to look at it; and I think the largest of these

tufts must be full two feet in circumference. Its situation is on the north side of an old wall, about five feet high; but it is sheltered from the north and north-east wind. It is growing in company with a good deal of *Polypodium vulgare*, and a little of *Scolopendrium vulgare*. Considering it important, if possible, to discover the history of this little old wall, I have, according to custom, consulted the 'oldest inhabitant,' who, on being taken to the spot, and questioned as to its archæology, informed me that, when he was young, there stood a large old barn there, but that it was pulled down 'better nor thirty years ago.' This wall is evidently part of the old barn. The luxuriance with which the *Asplenium fontanum* is growing, and the apparently great age of some of the plants (as shown by their size), lead me strongly to believe that it is as truly a native of the locality in which I have found it as the other ferns growing with it. I have measured some of the fronds which I have by me, and find the largest to be close upon six inches long. I have not yet worked the neighbourhood closely for ferns, but have observed *Ceterach officinarum*, *Asplenium Trichomanes*, *A. Ruta-muraria*, and other wall-loving species, whose presence shows that the locality is not adverse to the existence of *A. fontanum*. I have great hopes that, on working the neighbourhood closer, I may find it in other situations near. I have myself known of its existence in the above situation for several years, and have often gone to look at it, and admired its beautiful tufts; but I only began collecting the ferns this year, and then, for the first time, thought of examining closely my old friend, and, with the help of Moore's valuable 'Hand-Book,' soon discovered its value. I am advised, for obvious reasons, not to publish the exact locality, but will add that it is 'not a hundred miles' from the place whence I date this."

Veronica spicata, *Vicia Bithynica*, &c., in North Wales.

The President read the following note, from Mr. T. W. Gissing, dated Worcester, November 3, 1852:—

"Observing in the 'Phytologist' for November (Phytol. iv. 734) that Messrs. Shipley and Reynolds had seen *Veronica spicata* in North Wales, I was reminded that I had discovered the same plant by the Severn, in September, 1851, about four miles from Worcester. There seems considerable doubt respecting its wildness. Certainly its habitat was somewhat suspicious, being within a few yards of a garden; but all the plants of *V. spicata* I have observed in gardens have invariably been hairy, generally very much so; whereas the

plants I found were destitute of hairs. I went again this year, and found it in the same place, with a very slight hairiness. Does age or cultivation render it hairy? It did not flower this year, having been mown down with the grass amidst which it grew.

“Whilst wandering, last June, in this neighbourhood, in search of plants, I found *Vicia Bithynica*, sparingly scattered over a few yards of ground, in a thicket at the base of Crookbarrow Hill, at a distance of about two miles and a half from Worcester. I am induced to mention this, on account of being informed by botanists, who have resided here some years, that it has never been found so near this city before. Mr. Lees, I believe, has found it at Malvern; and another habitat is given by Dr. Stokes (in *Withering*), at Clifton-on-Teme. These are the only two places I have seen given as habitats for *V. Bithynica* in this county. In August, while walking with a friend, by the same thicket, he called my attention to *Allium oleraceum*, which was growing in one spot only, three feet in diameter. One side of Crookbarrow Hill yields *Spiranthes autumnalis* rather plentifully.”

Lycopodium inundatum on Wimbledon Common.

The President read the following note, from Mr. R. Heward, dated Kensington, November 4, 1852:—

“In the ‘*Phytologist*’ for October (*Phytol.* iv. 698) I read a remark relative to the disappearance of *Lycopodium inundatum* from Wimbledon Common, I am not aware whether it exists there at present; but I collected specimens about twenty years since, in a small ravine near the windmill, where it was growing in small patches, and only over a small space of ground.”

Gymnogramma leptophylla in Scotland.

The President read the following note, from Mr. W. Tanner, dated Bristol, June 11, 1852:—

“I send the following memorandum, which I made when in Madeira, respecting the habitat of the supposed *Gymnogramma leptophylla* (but which I had mislaid), thinking it may be of some interest:— ‘On a stone wall in Aberdeenshire, south of Invercauld House,* and east of Castletown.’ ”

* “I have it written ‘Invercauld Ho.,’ which, I suppose, must have been intended for House, but do not know whether there is any such house.”

A Descriptive List of the British Rubi.

By EDWIN LEES, Esq., F.L.S.*

RUBUS. *Raspberry and Bramble.* This intricate tribe has of late years received much attention from Mr. Borrer and Dr. Lindley; and more recently still Mr. Leighton, Dr. Bell Salter, the Rev. Andrew Bloxam, and Mr. Babington, have closely investigated the subject, and all published their ideas in monographs or fasciculi of specimens, so that the British Rubi are now much better looked after than formerly, and may be examined with some hope of being understood. As I have myself, to use a simile of Dr. Lindley's, I hope as "a fair sportsman," struck down some game in the same field, I must use my right to dress up the spoils after my own fashion: but whether the varied forms of Rubi are studied or not, the experience of all will probably show Dr. Walcott to be correct when he says—

"In our journey through life, my dear Joan, I suppose,
We shall oft meet a *Bramble*, and sometimes a *Rose*."

A. *Fruticose brambles, arched and rooting at the extremity.*

Subperennial.

i. RUBI CÆSII. Barren stem pruinose, with unequal prickles, generally with few setæ, prostrate unless supported.

R. cæsius, Linn. Stem glaucous, round, prickles slender, leaves mostly ternate, flexible and naked, panicle simple glandular, fruit glaucous, with the sepals inflexed. In low shady places.

Numerous varieties occur, more or less stout, according to exposure; one of the most remarkable is my *nudatus* (Steele's 'Hand-book'), in which the glands are obliterated. Another, the var. *Pseudo-Idæus* of Rub. Germ., has its foliage pinnate like the raspberry, with a stout erect stem. This grows at Rushwick near Worcester.

R. dumetorum, W. and N. Stem angular, setose, prickles numerous, unequal: leaves quinate, coriaceous, downy beneath; panicle branched, setose; calyx involute on the fruit. In hedges.

Many varieties occur, difficult to discriminate, the only unvarying characteristic form being the "ferox" of Rub. Germ., which is very stout, large, and prickly.

* From 'The Botany and Geology of Malvern, by Edwin Lees, F.L.S.'

R. Wahlbergii, Arrh. Stem angular, excessively armed with unequal prickles and setæ; leaves pedate-quinate, with overlapping leaflets, hairy on both sides; panicle branched, long, leafy and setose; sepals patent glandular; "drupes glaucous with silky hairs." Banks of Leigh Brook near Bridges-stone Mill.

R. sublustris. Stem angular, smooth (setæ rare), with distant prickles; leaves quinate, smooth above, green with soft pubescence beneath, last pair of leaflets sessile, overlapping; panicle corymbose, downy, leafy below; sepals reflex in fruit. Hedges in the low country.

This is the "*corylifolius*" of Smith, confounded by Weihe and Nees with their *dumetorum*. The flowers are generally white, appearing early, but some varieties have them purple; in others the leaves assume a monstrous aspect, the central leaflet divided. The most remarkable deviation from the type is my var. *cœnosus* (Steele's 'Handbook'), in which the stem is hairy, covered with sessile white glands, and thus often *begrimed with dust*; the panicle much branched, with numerous pale glands, and downy corymbose branches.

ii. RUBI GLANDULOSI. Barren stem arching or procumbent, more or less covered with aciculi and setæ.

R. tenui-armatus, Lees. Stem angular, sparingly setose; prickles scattered, slender, very weak, nearly equal; leaves pedate or quinate, the lowest pair of leaflets sessile, central one ovate or cordate-ovate, acuminate, all sharply serrate, downy or glaucous beneath; panicle with distant leafy branches, hairy and armed with long descending weak prickles, many setæ, and a few pale aciculi, crowded at the summit; the sepals tomentose, patent after flowering. In hedges and thickets about Great Malvern.

This characteristic species has been confounded with the dubious *Schleicheri* of Rub. Germ., but is certainly not the *Schleicheri* of Leighton's Fascic., neither, I think, of W. and N. It approaches some varieties of *dumetorum*, but may always be distinguished by its weak prickles, that are broken at the slightest touch, its involute sepals, and scattered leafy panicle.

R. Guntheri, W. and N. Stem prostrate, angular, clothed with long hairs and numerous setæ, aciculi, and slender prickles; leaves ternate, quaternate, and quinate, smooth above, pilose beneath, the central leaflet obovate acuminate; panicle narrow, flexuous, subracemose, hairy and glandular, with a few weak prickles; petals narrow; sepals elongated, closely reflex in fruit. Crow's-nest Wood in profusion, but a local species.

R. Bellardi, W. and N. Stem procumbent, closely hairy and setose; prickles small, weak, and numerous; leaves mostly ternate, with pale, prominent, ciliated ribs beneath; panicle closely hairy, with short aciculi, longer setæ, and weak deflexed prickles; its lower branches distant leafy, crowded at the summit; the sepals patent about the half-ripe fruit. In Rough Hill Wood to the summit. Also in woods on the Old Storage, and near Cradley.

R. Lejeunei, W. and N. Stem angular, armed with unequal prickles, with few setæ, passing into pale, weak aciculi; leaves ternate, quaternate, and quinate, often large; if ternate, the lateral lobes large, bulging towards the stem, the central one widely separate, ovate, and sharply doubly-serrate, all hairy above and downy on the ribs beneath; panicle with three or four spreading, axillary, leafy, corymbose branches, and about the same number of upper short ones, the whole much divaricated and bending when in fruit, covered with soft hairs, setæ, and aciculi, most numerous towards the summit; calyces woolly, setose, and prickly; loosely reflex in fruit. Plentiful in a dingle at the north side of Rough Hill.

The long lower branches, spreading almost at right angles, and forming a singularly wide panicle, give this plant a peculiar aspect, especially when pendent in fruit. It probably osculates with *R. rosaceus*.

R. pallidus, W. and N. Stem angular, trailing, armed with distant prickles, copiously fringed with stellate hairs, setæ, and aciculi, forming an hispid fringe surrounding the stem on all sides; leaves ternate or quinate, the leaflets elliptical, central one slightly obovate, narrowed at the base, with a long cusp, all bright green above, pallid beneath; panicle broad, hairy, and setose, with long pale prickles, and distant, corymbose, leafy branches. In Cowleigh Park plentiful.

β. Hystrix. Stem thicker, but otherwise similar; the leaves larger, all quinate with coarser serratures, pale green, and never canescent; rachis more hairy than the barren stem, and fringed with glands and aciculi; panicle very long, its lower branches very distant, leafy, and corymbose, gradually shortening and approximating to the summit. In the same thickets with pallidus.

Pallidus is a most variable plant in woods, often very attenuated and trailing, but always marked by its *elliptical* leaflets; the flowers frequently a bright mottled red, as are those of hystrix, and it appears to me that there is little difference between them, or rather a complete graduation from one to the other. Fruit seldom perfected.

R. fuscus, W. and N. Stem prostrate, succulent, hairy, with few

setæ and weak prickles; leaves large, thick, and coriaceous, coarsely serrate, green and velvety beneath; panicle long, straggling, corymbose, often leafy to the summit, densely hairy and setose, with slender prickles interspersed; sepals hairy and setose, closely investing the half-ripe fruit. In Cowleigh Park, and forming intricate thickets in Brockhill Wood, Colwall: green through the winter.

Very fine specimens have elongated, wide-spreading, nutant, and thyrsiform panicles, after the manner of *R. thyrsiflorus*, W. and N.: leaves larger and thicker than in any other British bramble.

R. fusco-ater, W. and N. Stem fringed with hairs, densely clothed with setæ and aciculi, graduating into unequal pale prickles; leaves pedate or quinate, the lowest pair on short stalks retrorse, the central one obovate or cordate-ovate, with unequal teeth, cuspidate, gray, with abundant hairs beneath; rachis clothed as the stem, grisly with hairs; panicle very hairy and setose, armed with long pale prickles; its branches short and leafy below, distant, but crowded at the summit; sepals silky, with long hairs extending beyond the setæ, reflex. In Cowleigh Park, and other thickety spots.

A variable plant, much confounded in herbaria. I suspect the *R. Schleicheri* of W. and N. to be a state of it.

R. Kœhleri, W. and N. Stem densely armed with unequal straight prickles passing into aciculi; leaves quinate, with elliptical sharply serrate leaflets, closely hairy beneath; panicle long, narrow, very prickly, and setose. Not uncommon.

In its typical state easily distinguishable; but if *fusco-ater* be referred to it, as is done by Dr. Bell Salter, confusion at once ensues. I am inclined to refer the *echinatus* of Lindley here, as a form with a wider and more leafy panicle, and, if possible, more setose. This grows in Cowleigh Park.

R. hirtus, W. and N. Stem excessively hairy, the dense hairs extending beyond the setæ; prickles slender, deflexed; leaves on densely hairy and setose petioles, their leaflets sharply cut, and gray with appressed hairs beneath; rachis densely hairy, setose, and prickly; panicle with distant acutely-ascending leafy branches below, upper ones crowded; peduncles and calyces shaggy, with long hairs concealing setæ. In thick woods.

β. candicans. The petioles, under side of the leaves, rachis, and panicle canescent, with such thick-set hairs that the setæ are completely buried in them. In the Priory Grove, Little Malvern. This remarkable form Mr. Babington has referred to *R. fusco-ater*, but I think it belongs to *hirtus*.

R. scaber, W. and N. Stem angular, not hairy, but horrent with falcate or strongly declining prickles, intermixed with innumerable short setæ and aciculi, all having red verrucose bases dispersed on all sides; leaves ternate or pedate, smooth beneath, leaflets obovate, crisped and wavy at the margin, deeply cut, their midribs fringed with small prickles; panicle long, spreading, subracemose; lower branches distant, leafy, upper ones closer; peduncles hairy, densely prickly, and closely setose; sepals woolly and thorny, loosely reflex in flower and fruit. Rare. Woods on the Old Storage. An excessively prickly form.

R. rudis, W. and N. Stem dark and sulcate, hispid with short setæ, the prickles extending beyond them; leaves quinate, their lateral leaflets elliptical; central one obovate, lanceolate, sharply incised, gray with pubescence beneath; panicle long, hairy, leafy, very setose and prickly, with short branches crowded at the summits. Common in woods and thickets.

R. Radula, W. and N. Stem hispid, with numerous nearly equal setæ and few aciculi, above which the prickles stand very distinct and unconnected; leaves quinate, their leaflets ovato-elliptical, central one ovate, grayish beneath, and doubly dentate; panicle long, hairy, and setose, armed with long descending prickles; lower branches distant and leafy, upper ones closer; sepals very hairy and setose, elongated and reflex. Woods and thickets.

A fine straggling thicket bramble, and variable in aspect according to exposure; but differing from the general mass of glandulose Rubi by the fringe of setæ and aciculi on its barren stem not graduating into prickles, and the latter not ranging very close together.

iii. RUBI VILLOSI. Stem angular, arching, more or less hairy, with occasional setæ; rachis very hairy.

R. villicaulis, W. and N. Stem covered with dense white hairs; leaves quinate, densely ciliated with stiff hairs beneath; rachis closely covered with spreading and decumbent hairs; panicle long, with alternating ascending short cymose branches, the greater number naked, and few-flowered towards the summit. Not common. Rough Hill Dingle, and woods at Alfrick.

Very characteristic from the white silkiness of the long, mostly narrow panicle, and downy floral leaves. One of the most elegant of British brambles, if contemplated just before the expansion of the flowers.

R. vestitus, W. and N. (*R. leucostachys*, Sm.) Stem covered with fascicled unequal hairs (often in maturity denuded); prickles pun-

gent, hairy ; leaves quinate, coriaceous, on hairy and prickly petioles, and white with dense pubescence beneath, the central leaflet roundish-cordate, cuspidate ; panicle long, very hairy, closely armed in the central part, but less so above and below ; calyx covered with long hairs, concealing glands ; petals downy. Rough Hill Wood, &c. Rather common.

A well-marked form in its typical state, but very puzzling varieties with denuded stems often occur.

R. incurvatus, Bab. Stem angular, sulcate, slightly clothed with scattered hairs, and armed with distant declining prickles ; leaves pedate or quinate, central and intermediate leaflets ovate, undulating, crisped, and serrate-dentate at the edges, gradually acuminate, and ending in a curved point, the lower pair of leaflets seated on the intermediate, and somewhat overlapped by them ; rachis downy ; panicle long, flexuous, with distant racemous branches, the greater portion leafy, upper ones short and densely clustered ; peduncles downy and densely hairy, armed with long pale prickles ; calyx closely downy ; the sepals incurved about the flowers and immature fruit. Rare. Thickets between Cowleigh and Worcester.

This has a peculiar aspect, with a long narrow panicle, far more crowded and hairy than that of *corylifolius*, to which Dr. Bell Salter has referred it.

R. pampinosus. Stem angular, polished, with only short inconspicuous hairs, armed with many very small declining prickles at the base, longer higher up the stem ; leaves large, thin, and flexible, with scattered ciliated hairs on the veins beneath, lower leaflets seated on the intermediate, central one ovate or cordate-ovate, with coarse serratures ; rachis with a dense fringe of spreading hairs ; panicle very long, with paniculate lower branches, shortening but spreading out wider as they ascend in a thyrsiform manner, and with ternate axillary leaves nearly to the summit ; sepals densely hairy, with scattered prickles, loosely reflex in flower and fruit. In dense thickets, Cowleigh Park.

A very remarkable bramble, with leaves so large and numerous as almost to conceal the stem. It is related to my friend Bloxam's *R. calvatus*, but without the savage aspect of that rough bramble ; its leaves are almost naked, green on both sides, and its enormously lengthened, wide-spreading panicle, whose upper branches are nutant in fruit, give it claims to correct discrimination. The stem often becomes quite denuded, when it might be confounded with *R. cordifolius*.

iv. RUBI PILOSI. Stem arching, angular, with equal prickles, sparingly clothed with spreading hairs.

R. carpinifolius, W. and N. Stem clothed with scattered hairs, and armed with yellowish deflexed prickles; leaves quinate, hairy above, glaucous-green and pubescent beneath, central leaflet obtusely wedge-shaped, with a long cusp; panicle long, often narrow, white with hairs concealing glands, close at the summit. Colwall Woods.

R. amplificatus, Lees. Stem decumbent, very long, with scattered hairs, and deflexed prickles; leaves quinate, the leaflets elliptical, central one with a long cusp; panicle long, narrow, hairy, leafy below, the branches short and few-flowered above. In most of the woods about Malvern and Worcester.

β. *Schlechtendalii*, W. and N. Stronger and larger, with a wider developed panicle, and monstrous foliage. A singular bush of this form grows in Cowleigh Park, where it has existed many years, in the ravine by a little bridge; it has enormously developed panicles, with long paniculate branches. The shrub extends itself proliferously by annual shoots (not rooting) proceeding from the axils of the leaves.

R. macrophyllus, W. and N. Stem clothed with hairs, prickles numerous but small; leaves ternate and quinate, smooth above, the ribs and veins covered with long hairs beneath; rachis densely clothed with hairs; panicle long, with numerous spreading branches, leafy nearly to the summit; peduncles hairy, often concealing glands; fruit small. Upper part of Cowleigh Park.

v. RUBI CANDICANTES. Stem sulcate, angular, glaucous, hoary, with equal prickles.

R. discolor, W. and N. Stem glaucous, with minute pubescence; prickles falcate, strong, and numerous; leaves quinate, smooth above, hoary-white beneath, coriaceous; leaflets elliptical or ovate-oblong, acute, and deeply serrate; panicle long, narrow, compound, hoary, with patent almost leafless branches. Woods and thickets. Common.

This is the old "fruticosus" of English authors, and although not so variable as many other brambles, yet in the variety *macroacanthus* the stem becomes so silky, and the panicle loosely tomentose, as to put on a very different aspect to the type. Perhaps the following should only be considered a variety, but its aspect is very elegant.

R. argenteus, W. and N. Stem downy, or closely tomentose; leaves quinate, their leaflets sharply dentate, with long cusps, smooth and shining above, silvery, with dense tomentum beneath; rachis

tomentose; panicle hairy and prickly, the upper branches densely crowded; peduncles shaggy, closely armed with slender prickles; sepals densely tomentose, closely reflex in fruit. Not common. Hedges near Cotheridge.

vi. RUBI NITIDI. Stem arched, angular, sulcate, smooth; prickles nearly equal; sepals reflex in fruit.

R. Lindleianus. Stem hairy at the base, but with only scattered hairs and polished above; prickles numerous, sharp, declining; leaves quinate, their leaflets elliptical, jaggedly serrate, and plicate at the edges; panicle long, with numerous branches, generally spreading at right angles to the stem, densely crowded, compound and thorny, clothed with unequal hairs; floral leaves incised, narrowing upwards to the entangled summit. Hedges and thickets. Not uncommon.

This bramble I originally received from Mr. Leighton, the author of the 'Shropshire Flora,' as *R. leucostachys* of Dr. Lindley; but it is not the plant of Smith. Mr. Babington continues the name of *nitidus* for it, as given by Dr. Bell Salter; but not being the plant of 'Rubi Germanici,' it can have no claim to an appellation given in error. See 'Phytologist' for a full account of this plant.

R. cordifolius, W. and N. Stem quite smooth, with distant prickles; leaves quinate, coriaceous, grayish-green beneath; central leaflet cordate; panicle downy, lower branches spreading, leafy, upper ones cymose, crowded. Common in woods.

R. affinis, W. and N. Stem sub-erect, finally arching, smooth and polished, with declining yellow-pointed prickles; leaves quinate, all the leaflets stalked and plicate, shining above, pale green with soft pubescence beneath, irregularly dentate, central one cordate-ovate, acuminate; panicle short and broad at the summit, with two or three distant axillary branches below; peduncles hairy, densely prickly; sepals hairy, elongated, reflex after flowering, but again rising to half invest the deep black cylindrical fruit. Forming thickets among waste pastures below Malvern Wells, but rare.

This bramble seldom throws out rooting shoots, and never, as far as I have seen, occurs in hedges. Distinguishable at first sight from the two preceding, and closely approaching the sub-erect brambles.

B. *Fruticose brambles, erect or sub-erect, not rooting. Biennial.*

vii. RUBI SUBERECTI. Sub-erect, with quinate or septenate leaves.

R. plicatus, W. and N. Stem sub-erect, angular, smooth, and

polished ; prickles strong and sharp ; leaves quinate, the leaflets all stalked, central one cordate-ovate, dentate apiculate, with wide serratures, cuspidate, dark green above, pale green and pilose beneath ; rachis downy ; panicle simple, or long with many axillary branches, and large floral leaves ; sepals pilose, patent, or very loosely reflex in fruit. Rare. In moist thickets below Moorall's Well, Colwall. Birchen Grove, Worcester.

A fine tall shrub, its stem rising high in thick woods in a sub-erect manner, and often remains without any support the second year, in this case throwing out short bunches of flowering shoots from the summit, after the manner of the raspberry ; but when the stem declines to the ground the panicle becomes longer, and the lower branches distant ; the floral leaves are very large, ternate below, cordate above, and often rising above the panicle ; fruit large, irregular, consisting of many drupeolæ, red for a time, finally deep black ; the calyx is but loosely reflex, and its pilose sepals often even invest the ripe fruit.

viii. RUBI IDÆI. Erect, generally with pinnate leaves.

R. Idæus, Linn. Raspberry. Stem round, pruinose, covered with minute prickles ; leaves pinnate, white and plaited beneath ; flowers in axillary corymbs, drooping. Woods of Colwall, Mathon, &c. ; base of the North Hill, below the Ivyscar Rock.

The rapid Increase of Anacharis Alsinastrum compared with the Diffusion of other Introduced Species. By the Rev. R. C. DOUGLAS, M.A.

THE extraordinary increase of *Anacharis Alsinastrum* in the Cambridgeshire fens and elsewhere, naturally suggests inquiry into the introduction of other foreign species. The number of alien plants in our Floras is not small ; but most of them lead a very precarious life : many are confined to very small areas ; many struggle for existence about old ruins, or deserted cottages, "where many a garden plant grows wild."

The animal kingdom furnishes us with numerous instances of species originally introduced, yet soon spreading over the length and breadth of their adopted country. The English Fauna gives us three notable examples from the ranks of the Vertebrata and Invertebrata, viz., the brown rat (or Norway rat, as it is sometimes called, although

it is an introduced species in Norway as well as in England), the cockroach (*Blatta orientalis*), probably brought over in ships from the Levant, and the fresh-water mussel (*Dreissena polymorpha*). These species are mentioned towards the end of Mr. Marshall's very interesting letters on *Anacharis* (Phytol. iv. 714); but the diffusion of *Dreissena polymorpha* in our canals (though, from the harmless and obscure habits of the animal, it has not attracted general observation) bears so many points of resemblance to the rapid spread of *Anacharis*, that I may be pardoned for extracting the following passage from the 'British Mollusca' of Prof. Forbes and Mr. Hanley:—

"These mussels live gregarious, often attached in great numbers to each other, in fresh and brackish waters. Originally, apparently, inhabitants of the rivers around the Black Sea, they have gradually extended their range all over Europe; capable of enduring salt-water for a time, they have, probably, been carried across seas on the bottoms of ships, and in this manner have reached England and become so common in our canals, as to be much more abundant than many of our indigenous mollusks. Its history as a British species, dates from 1824, when Mr. J. de Carle Sowerby exhibited it to the Linnean Society, stating that it was found 'in abundance, attached to shells and timber, in the Commercial Docks, by James Bryant, Esq., who used the animal as bait for perch.' Mr. Stark found it in the Union Canal, near Edinburgh, in 1834, and the Rev. M. J. Berkeley observed it in the Nen, in 1836. In the latter case, the discoverer believed it had been introduced from Wisbeach, on timber, in 1828. Thus, it would appear to have found its way into Britain, at several points, and is now common in the canals of the Midland and Northern counties."—*Brit. Moll.* ii. 167.

The only striking instance of the rapid and unwelcome spread of introduced plants which I have been able to find, at all resembling the case of our *Anacharis*, occurred to me, unexpectedly, yesterday, whilst cutting my way (paper-knife in hand) through the pleasant pages of the recently-published second edition of Schleiden's 'The Plant.' At page 350 of that work we read:—

"The Pampas of Buenos Ayres have a character similar to that of the North American prairies, only man by his influence upon Nature has here and there impressed a peculiar stamp. The thistle and artichoke coming with the Europeans have quickly made themselves masters of the free soil, and with incredible rapidity overspread districts of many square miles with their spiny vegetation, which has developed in a luxuriance unknown in Europe. These thistle-wastes

have become a terrible nuisance, themselves robbers, depriving better plants of the soil, inaccessible hiding-places for the great thievish and sanguinary cats, and the still more dangerous human bandits, the thorny weed of semi-civilization."

Can any reader of the 'Phytologist' furnish us with a more extended account of the facts here stated? The subject is one of importance to all who feel the slightest interest in the geography of plants.

R. C. DOUGLAS.

Forebridge, Stafford,
January 10, 1853.

Extracts from the 'Proceedings of the Linnean Society.'

(Continued from page 452).

On the Position of the Raphe in Anatropal Ovules ; by Benjamin Clark, Esq., F.L.S., &c.

Mr. Clarke believes that this character, which has hitherto attracted but partial attention, is a character of much constancy in the several families, and therefore deserving a more complete examination. He states the most usual position of the raphe, when each of the carpelary margins bears a single row of anatropal ovules, as in *Pæonia*, to be lateral and turned towards the raphe of the ovules of the opposite row; and the curvature of the ovule has the same direction even in cases where the ovule is not anatropal, as in *Colutea arborescens*. The position of raphe with reference to placenta is less regular where the ovules are more numerous, but in some cases, as in *Gomphocarpus*, it is observed to be always next the placenta, the ovules being pendulous with long funiculi; and in *Cuphea* and *Reaumuria* also next the placenta with the ovules erect.

It is, however, when the anatropal ovule is single that Mr. Clarke believes the position of the raphe affords the most important characters, and he proceeds to consider the various relations which it bears to the placenta under six different heads, as follows:—

1. Ovule pendulous; raphe turned away from the placenta.
2. Ovule pendulous; raphe lateral.
3. Ovule pendulous; raphe next the placenta.
4. Ovule erect; raphe turned away from the placenta.

5. Ovule erect ; raphe lateral.

6. Ovule erect ; raphe next the placenta.

1. *The pendulous ovule, with the raphe turned away from the placenta*, was first observed by Mr. Brown, and afterwards figured and described by Dr. Schleiden as "*ovulum spurie pendulum anatropum, raphe aversâ.*" Mr. Clarke finds it to be of more frequent occurrence than is generally supposed ; it is found among Endogenous plants, not only in *Typha* and *Sparganium*, but also in *Chamædorea elegans* (the ovule of which is, however, not completely pendulous) ; and *Zannichellia* and *Potamogeton* show a decided tendency towards it by the direction to which the ovule curves. He considers it a principal argument in favour of its being frequent at least, if not constant, in Endogenous plants, that it occurs in those groups by means of which the Endogenous and Exogenous divisions approach each other, as in *Aroideæ* and *Piperaceæ*, and in *Ranunculaceæ* and *Alismaceæ*. As Exogenous plants, in which the raphe is averse, he instances :—

1. *Ranunculaceæ* (when the ovule is pendulous). 2. *Nelumbium*. 3. *Malpighiaceæ* (in those genera in which the funiculus is next the dorsal rib of the carpel). 4. *Coriaria*. 5. *Rhus Toxicodendron*, and not improbably *Anacardiaceæ* generally. 6. *Euonymus*. 7. *Visnea*. 8. *Pennantia*, which he thinks should perhaps be referred to *Olacineæ*. 9. *Chenopodiaceæ*. 10. *Amaranthaceæ*. 11. *Paronychia capitata* (in the three last cases the ovule is not completely inverted, being campylotropal, but the direction of the curvature is such, that were the inversion complete, the raphe would be averse). 12. *Plumbagineæ*. 13. *Laurineæ*. 14. *Aucuba*. 15. *Calycanthus* (in which the ovule at the base is erect with the raphe next the placenta, and the upper one or two ovules are bent away from the placenta so as to become nearly horizontal, showing a tendency to *raphe aversa*). 16. *Belvisiæ*? 17. *Dipsacus sylvestris*. 18. *Galenia* and *Tetragonia*. 19. *Fumaria officinalis* (which shows at least a decided tendency to the same structure in having the radicle beneath the horizontal seed and turned to the hilum). Mr. Clarke adds, that he has examined numerous cases where the carpel when single is anterior, and has not yet met with any examples of this character, except in the instances of *Dipsaceæ*, *Tetragonieæ* and *Fumaria*. He notices some remarkable variations in the position of the raphe in the ovules of *Visnea Mocanera*, both when solitary and when there are two ; and concludes this section by some observations on the question whether the campylotropal ovule of *Amaranthaceæ*, &c. (in which the embryo subsequently formed is turned towards the placenta) is a character

equivalent to the pendulous anatropal ovule with *raphe aversa*. That it is so, he thinks proved by the examples of Statice and Plumbago, the structure of which he describes and compares with that of Gomphrena and Philoxerus; and he adduces the instances of Trianthema on the one hand, and Galenia and Tetragonia on the other, as well as certain genera of Sapindaceæ, in which the embryo is more or less curved, to show that there is no absolute distinction between anatropal and campylotropal ovules.

2. *The pendulous ovule, with the raphe lateral*, is a character of frequent occurrence; it was particularly noticed and accurately figured in Cornus and Marlea, in Sir W. Hooker's 'Journal' for May, 1850. Mr. Clarke has hitherto observed it in only two instances in which the carpel may be considered as anterior, *viz.*, in Goniocarpus and Valeriana; but it is nearly so in Trichocladus, and probably also in Morina. He has not yet observed it among Endogenous plants. Of its occurrence among Exogenous plants, he enumerates the following instances:—1. Malpighia, and other genera of Malpighiaceæ, in which the funiculus (representing the raphe) is constantly lateral. 2. Suriana, as figured by Prof. Lindley. 3. Ilex. 4. Halesia. 5. Viburnum. 6. Acrotriche. 7. Myoporum. 8. Lonnicera (sp. *loculis uniovulatis*). 9. Probably in the 1-seeded fruits of Oleinæ. 10. Thesium. This section concludes with some observations on the variation from *raphe aversa* to *raphe lateralis*, which sometimes occurs in the same family, as in Corneæ and Malpighiaceæ, which Mr. Clarke believes to offer an explanation of the variable relation of the ovule to the funiculus, which is common to both Illecebreæ and Chenopodiaceæ.

3. *The raphe next the placenta* is well known as the most ordinary position in pendulous anatropal ovules, and Mr. Clarke only suggests the inquiry whether solitary ovules having this character ever occur among Endogenous plants.

4. *Of the erect ovule, with the raphe turned away from the placenta*, Mr. Clarke has met with only three instances, two of them occurring in cases where there are two ovules. These are Penæa fruticulosa and Calytrix virgata, in the latter case less completely averse than in the former. The principal instance, however, is that of Compositæ, where the raphe in four or five genera examined was always found to correspond with the anterior angle of the ovary. That the anterior is the fertile carpel in Compositæ Mr. Clarke thinks is shown (in addition to the arguments previously adduced by him) by the fact that in Aster Sibiricum, he has always found the ovule

to arise more or less distinctly from the posterior side of the ovary, and that the same circumstance occurs, although less distinctly, in *Centaurea nigra*. In such *Cichoraceæ* as he has examined, he has found the raphe for the most part or always lateral; but as he regards the carpella of this division of *Compositæ* as being right and left of the axis, he concludes that the position of the ovule might be expected to be different. The position of the raphe in *Berberis vulgaris* is occasionally next the placenta, but more frequently tends to be averse to it.

5. The character of *ovule erect, with the raphe lateral* (first observed by Mr. Bennett in *Rhamneæ*, and by him attributed to a torsion of the funiculus), obtains to a considerable extent among *Exogenous* families. It occurs regularly in *Stilbe pinastrea*, and generally in one-seeded fruits of *Berberis vulgaris*; but in two-seeded fruits of the latter the raphe is removed from the placenta and placed nearer to the dorsal rib of the ovary. In *Vitis*, on the contrary, whether with one- or two-seeded cells, the raphe is always next the placenta. In a species of *Justicia*, with two ovules, placed one above the other and quite erect, the raphe is lateral; but in *Mendozia*, with a similar placentation, it is apparently next the axis. As other instances of lateral raphe with erect ovules Mr. Clarke cites *Elæagnus orientalis*, *Calamus viminalis*, and *Trianthema decandra*, the direction of the curvature in the embryo of the latter being regarded as analogous to the position of the raphe in the two former.

6. The position of the raphe next the placenta is well known to be the ordinary condition in erect anatropal ovules, and on this head the author enters into no details.

Mr. Clarke then proceeds to consider the causes by which these differences in the position of the raphe may be produced.

1. He adopts the opinion (first demonstrated by Mr. Brown) that a single ovule pendulous with *raphe aversa* is the result of an erect ovule pressed or growing downwards from the elongation of the cavity of the ovarium in that direction, while its upper part remains stationary; but suggests that it is only when an erect ovule has the raphe properly next the placenta that it has *raphe aversa*, when it thus becomes pendulous. And looking to their affinities, he thinks it not improbable that all pendulous orthotropal ovules should be referred to the same cause.

2. He believes that a single pendulous ovule with the raphe lateral is an ovule originally extending horizontally from the placenta with

the raphe lateral, as in Ranunculaceæ and Cucurbitaceæ, and subsequently pressed downwards as in the former case.

3. He maintains that a single pendulous ovule with the raphe next the placenta is the only true pendulous ovule, with the exception of pendulous campylotropal and amphitropal ovules with the foramen (and subsequently the radicle of the embryo) turned away from the placenta.

4. He conceives that one or two erect ovules with the raphe turned away or obliquely away from the placenta result from pendulous ovules pressed upwards by the elongation upwards of the cavity of the ovarium; and adduces in support of this opinion the pendulous ovules of *Geissoloma* contrasted with the erect ovules of *Penæa*, the erect ovules of *Calytrix* compared with the pendulous ovules of the neighbouring families, and the pendulous ovules of *Calycereæ* compared with the erect ovules of *Compositæ*, provided further observation should substantiate his belief that in the last-named family the raphe is really turned away from the placenta. Such ovules he would term *spuriè erecta*, in contradistinction to the opposite case, to which Sprengel has applied the term *spuriè pendula*.

5. He considers that a single ovule erect with the raphe lateral is a horizontal ovule spontaneously growing or pressed upwards by the corresponding development of the ovary; in proof of which he cites the fact that *Trianthema micrantha* has two seeds in a horizontal position, with the radicle lateral, while *T. decandra* has two erect seeds one above the other, with the radicle also in both cases lateral.

6. He considers one or two erect ovules with the raphe next the placenta (which seems general in Endogenous plants, and is frequent in all the divisions of Exogenous) as for the most part truly erect; although this position may sometimes be derived from horizontal ovules pressed upwards or spontaneously growing erect, the funiculus becoming at the same time twisted so as to bring the raphe into relation with the placenta.

Mr. Clarke then proceeds to illustrate the importance of these characters in a systematic point of view, as regards different families usually regarded as nearly related. He states that *Thymeleæ* differ from *Laurineæ* in having the raphe next the placenta, and that the same difference of relation occurs in *Sanguisorbeæ* and *Amygdaleæ*. In all the Urtical Orders with pendulous ovules the radicle is next the placenta, or if campylotropal the direction of the curvature is equivalent, and the radicle of the embryo is turned away from the placenta; while in the Chenopodal Orders with pendulous ovules the radicle is

either turned towards the placenta or placed on one side of it. The characters thus indicated may also, he thinks, tend to a more natural distribution of the Orders related to Rhamneæ, Rutaceæ and Sapindaceæ. He refers also to the differences in this respect existing between Berberis and Ranunculaceæ, Hedera and Cornus, Cinchonaceæ and Compositæ. He states that Erythroxylon differs from Malpighiaceæ in having the raphe next the placenta; and Selago in a similar manner from Myoporum and Stenochilus, in which the raphe is lateral. Scleranthus also differs both from Illecebreæ and Tetragonieæ in having the radicle turned directly away from the placenta.

In conclusion, Mr. Clarke observes that while *raphe aversa* and raphe lateral occur in several instances in the same family and possibly in the same genus (as the vertical and horizontal positions of the seed in *Chenopodium* appear to be equivalent characters), yet *raphe aversa*, or even raphe lateral, and raphe next the placenta are not known to occur in the same family—pendulous ovules only being understood. And also, that as far as his inquiries go, raphe next the placenta in pendulous ovules is unknown in Endogenous plants.

On Fœtid Vegetable Gums; by W. K. Loftus, Esq.

In this locality (Kerrind, Persia), the neighbourhood of which abounds in plants producing fœtid gums, Mr. Loftus, acting on Mr. Brown's recommendation, had procured several different kinds, of which, and of the plants producing them, he gives some particulars in his letter. Two of these belong to the genus *Dorema*, *Don*; and a third, derived from a plant, which Mr. Loftus regards as belonging to the tribe *Sileridæ*, is called in Kurdish "beeje." The three gums have the same general properties, and grow on a limestone soil, at the elevation of from 5000 to 7000 feet. Large quantities of gum are also produced by the wild almond, a species of *Astragalus*, and the *Pistacia vera*, which grow abundantly in the same neighbourhood; and there is, moreover, a kind of thistle, which exudes honey, especially from the bud, on being pierced by a species of *Rhynchophora*. Mr. Loftus proposes to resume his observations, as his party proceeds northward, in the course of the ensuing summer.

NOTICES OF NEW BOOKS, &c.

‘ *The Earth, Plants and Man: Popular Pictures of Nature.* By JOACHIM FREDERICK SCHOUW. Translated from the German, by ARTHUR HENFREY. London: Bohn. 1852.’

SCHOUW is one of the most learned as well as most pleasing of phytological writers; exactly, indeed, that kind of author who, in this country, would be pooh-poohed by our exclusives, as making science far too attractive and popular. It is a curious fact, that our magnates conceive there is a certain dignity in confining knowledge to channels which they themselves shall shape out; and they regard all other channels of information as vulgar, and unworthy their notice. Even the smallest of the small fry of scientific exclusives, those whose germination, to speak phytologically, has scarcely commenced, whose ascending plumule is scarcely visible, and whose radicle is wholly wanting, still turn up their noses scornfully at everything that may tend to popularise, or, as they deem it, vulgarise, science. They are either oblivious or ignorant of the immutable axiom, that there is no aristocracy in science, except the aristocracy of the mind. This wretched spirit is retarding, instead of advancing, knowledge; is impoverishing, if not ruining, our societies; and settles like an incubus on the inquiring and energetic spirits of the youth who, year after year, enter the fields of Nature, full of hope and enthusiasm. Luckily, Schouw is not a Briton; and therefore his works may be read, and even admired, without fear of incurring the displeasure of the exclusives; and the ‘Phytologist’ will be pardoned for introducing “extracts” which, as “original communications,” and written by an Englishman, would be held derogatory to the character of a scientific journal. We believe Schouw is a German by birth, although a Dane by adoption; and he holds the Professorship of Botany in the University of Copenhagen. His works are, we believe, invariably written in German and Danish; and those who are well acquainted with both languages, seem to regard the German as the better version of the same ideas. The work before us is translated from the German, by Mr. Henfrey, who may truly be called one of our most industrious and painstaking botanists; and his share of the task is admirably executed. Having thus explained that the following paragraphs are from the German of Schouw, as translated by Henfrey,

we disarm that criticism which their truthful simplicity would naturally evoke, were they original contributions to our pages :—

Man and Forests.—"Turning our attention, lastly, to the human race, we see that nations in the lowest state of development are sometimes closely connected with the forests. In the colder lands, where the trees ordinarily bear no edible, or at least no well-flavoured or nourishing fruits, it is the game which chiefly furnishes the inhabitants with food and clothing; these races then appear chiefly as hunters, such as the aborigines of North America. In the torrid zone, on the contrary, races in the same stage of culture live principally on the fruits of the trees or the pith of the trunks, like some of the tribes of Brazil, some of the inhabitants of the Indian Archipelago, and several races of negroes. South America even affords an example of a race who, almost like monkeys, live upon the trees; whose existence, in fact, is to a great extent bound to a certain species of tree. There are the Guarauni, at the mouth of the Orinoco, who live by and upon the Mauritia palm. While the ground is flooded, mats woven from the leaf-stalks of those palms are suspended between the trunks; these mats are covered with clay, so that fires can be made upon them, and here the Guarauni sleep, and pass a great portion of their lives. The trunk furnishes a fecula; the juice, a palm-wine; and the fruits are well-flavoured, mealy at first, and afterwards sweet. Nomadic races, on the other hand, generally avoid forests; extensive grazing plains, fertile valleys, or the slopes of mountains, affording rich pasture-land, are the best fitted for the migratory life which they lead, and for the support of their domestic animals. As soon as a race rises to agriculture, it becomes hostile to the forests. The trees are in the way of the spade and plough, and the wood gives less booty than the field, the garden, or the vineyard. The forest, therefore, falls beneath the axe, fire consumes the fallen trunks and branches, and the ashes manure the soil, giving for some years an extraordinarily rich harvest, especially in the dense tropical primæval forests. When, after the lapse of some years, the fertility decreases, a new portion of the wood is felled and burnt, and thus man proceeds unsparingly with the destruction of forests; sometimes the conflagration spreads further than was intended, and the destruction is thus increased. This is the course pursued by the peasants of Norway and Sweden, as also by the colonists of North America, of Brazil, Mexico, the Cape, Java, and in every place where agriculture first appears, or commences its first constant and uninterrupted extension. With the increase of population this destruction of the

forests is continued, for it brings with it increased consumption of the products of the forest; wood is required for houses, furniture, wagons, and other implements, for bridges, posts, for fences, fuel for cooking, and where the climate is cold, for warming the dwellings. The consumption of wood increases further with industry, with navigation and trade. Mining operations require timber, both for the works and for fuel to smelt the metals and ores; artisans and manufacturerers use large quantities of the products of forests; dams against rivers and seas require their share, but above all, navigation. The trunks of millions of trees are used up in ships and masts, in order to connect the highlands and inland districts with the coasts, and the coasts with each other, even beyond the ocean. In this way civilization comes into hostile contact with the forests, and thus, under like circumstances, the country in which civilization is oldest, possesses the fewest woods. Hence forests are more sparingly met with in the countries of the Mediterranean than northward of the Alps, and more sparingly in the centre than in the north of Europe, so far as the climate is not an obstacle to the growth of timber. Have not, then, our descendants to expect a great deficiency of timber—a deficiency which may readily become disastrous? Many public economists and philanthropists have assumed this to be the case, and many do still assume it; they depict the future destitution of timber in the darkest colours, they loudly complain of the felling of wood, and they demand that governments should prevent in time the ruinous consequences, by limiting the free use of wooded estates. Yet even as I have striven to demonstrate the groundlessness of the idea of the danger which is feared of alteration of climate, by the diminution of the forests in temperate countries, I hope also to be able in some measure to scatter the dark cloud which so many imagine they see hanging over future generations in regard to the product of forests. That which is true of so many other inconveniences following in the train of civilization, holds also with this. It has its cure, in a great measure, in itself.”

Man's Influence on the Vegetable Clothing of the Earth.—“But the influence of the Caucasian races, and of the Europeans in particular, in changing the distribution of characteristic plants, becomes far more extensively evident when we look to the colonies established in all climates, where in some cases the countries have passed wholly into the possession of an European population. For they have not only carried their own characteristic plants to the colonies, or those also which they had previously transplanted into their own homes,

but they have, after acquiring countries with different climatal conditions, transplanted into these such as would not flourish at home, and thus have found themselves in a position to collect the characteristic plants of almost every race around them. Thus have the European corn-plants acquired a widely-spreading cultivation throughout North America, in Mexico, and the elevated countries of South America, in Chili and Buenos Ayres, in South Africa, in the temperate parts of Australia and Van Diemen's Land; thus the vine has become an object of cultivation in Madeira, the Canary Islands, South Africa, and the highlands of South America; thus rice and cotton are now grown in extraordinary quantities in the warmer parts of North America and in Brazil; thus have the coffee-tree and the sugar-cane been transplanted into the West Indies and Brazil; the nutmeg and the clove into Mauritius and Bourbon, and various West Indian islands; and thus has the plantation of tea commenced in Brazil, in Java, and in India; and the cultivation of the New Zealand flax in New Holland. The Europeans have even conveyed characteristic plants to other races, which knew how to value them. They have transferred several European and tropical plants into the South Sea Islands, which, previously unknown, are now cultivated by the natives; the remnants of the American population which are still found in the highlands of Peru, Chili, and Mexico, have acquired European plants; in like manner the negroes of the west coast of Africa have received from the Europeans maize, tobacco, and other American plants. On the other hand, what other races have done to change the distribution of characteristic plants, is very little: the Arabs contributed to diffuse cotton, the sugar-cane, coffee, and the date-palm; but the Arabs belong to the same primary race as the Caucasians. The Chinese appear to have procured cotton from Hindostan, and the Japanese the tea-shrub from China. The Europeans, and above all the North Europeans, consequently are those who, both in their own home and in their colonies, have been able to acquire the greatest quantity of the characteristic plants of other races; while their own country, especially the North of Europe, is so very poor in characteristic plants; for all the important cultivated plants of Northern Europe have been introduced (cabbage, turnips, carrots and asparagus, which are perhaps indigenous, are among the less essential). We find in this a great proof of the intellectual superiority of these races, and we have here an example that the child of the poor man, gifted with great natural powers, industry, and activity, has far more power over prosperity than the rich heir. I know not whether there may be any among my

readers who would be inclined to see in these revolutions a serious confusion of nature, or might fear that as the races gradually appropriated each other's peculiar possessions, the globe would approach nearer and nearer to a tiresome uniformity. One sometimes hears expressions which indicate such a fear; complaints are now and then made, that interesting descriptions of strongly contrasted races become rarer in accounts of voyages and travels. Not only have many differences vanished in Europe, so that, for instance, in a drawing-room in Moscow one can fancy himself in Paris; but those attractive accounts of the natives of the South Sea Islands which the earlier circumnavigators gave us, are exchanged for reports of how the inhabitants of these islands now go clothed in the European fashion, build ships, establish schools for mutual instruction, and build churches. High up in the Himalayas, 7,000 feet above the sea, where a few years since a wild race dwelt, only visited by tired pedestrian Hindoo pilgrims, there are now, as Jacquemont reports, the baths of Simla, with sixty European houses, where people in shoes and silk stockings ride in European equipages to a dinner-party, served in the European fashion, where champagne and Rhenish wines are drunk. In Australia, where not long ago nature existed in virgin condition, and the savages stood at the lowest point, where a few suspended branches served to protect from the weather human beings who lived on sea-mollusks, there exist at present European cities, with hotels, coffee-houses, billiard-rooms, reading-rooms, and horse-races."

In conclusion, we have only to say that we cordially recommend this delightful book to the readers of the 'Phytologist,' and beg to assure them that no fear of the exclusives need alloy the pleasure with which they will peruse it.

'Principles of the Anatomy and Physiology of the Vegetable Cell.

By HUGO VON MOHL. Translated by ARTHUR HENFREY.

London: Van Voorst. 1852.'

This work, as appears from the author's Preface, which we have quoted entire, originally appeared as an article in Wagner's 'Cyclopædia of Physiology.' It is almost universally regarded as the highest authority on the subject of which it treats, the qualifying word, "almost," being required by the dissentient voices of some of the followers of Schleiden. The author writes throughout rather as a man who has

diligently studied his subject with a view to self-information, than as one who would dictate, or dogmatize, or enforce his own conclusions : everything is stated with the utmost candour ; and there is no apparent crotchet or hypothesis in the author's brain that leads him astray from the straightforward path of inquiry into his interesting, but rather recondite, subject. The translation affords yet another proof of Mr. Henfrey's untiring industry ; and in the present instance the subject is one in which, by praiseworthy assiduity, he has made himself perfectly at home.

Author's Preface.—"Mr. Arthur Henfrey having informed me that he intends publishing an English translation of the present treatise, I take this opportunity of making known to the English reader the purpose I had in view in the preparation of the book. The following pages were not originally intended to appear as an independent work, or to give a summary of the wide subject of the Anatomy and Physiology of Plants, but appeared as an article, in the 'Cyclopedia of Physiology' published by Dr. Rudolph Wagner, of Gottingen, drawn up to furnish students of Animal Physiology, and more particularly the Medical Profession, with a review of the Anatomical and Physiological conditions of Vegetables (of the Cell), in order to enable them to form a definite judgment upon the analogies which might be drawn between the structure and vital functions of animals and plants. This intention, together with the circumstance that I was compelled to crowd the whole exposition into the space of a few sheets, rendered it necessary to direct especial attention to the individual cell, as the fundamental organ of the Vegetable Organism. Since, however, the cell only presents itself in anatomical and physiological independence in the lowest plants, and since, in the more highly organized plants, both the structure and the physiological functions of the individual cells become subject to greater dependence upon the other parts of the plant, in proportion as the collective organization of the vegetable is more complex ; moreover, since functions then present themselves, of which no trace can be found in the lower plants, it became requisite to take account of the plants of higher rank, and of the various organs which these possess. The treatise therefore, contains if an imperfect, still, in many respects, a more extensive *resumé* of Vegetable Physiology, than might be conjectured from the title.

"Unhappily, the Physiology of Plants is a science which yet lies in its earliest infancy. Few of its dogmas can be regarded as settled beyond doubt ; at every step we meet with imperfect observations,

and consequently with the most contradictory views; thus for example, opinions are still quite divided regarding the doctrines of the development of the cell, of the origin of the embryo, and of the existence of an impregnation in the higher Cryptogams. Both in these and in other cases, the small compass of the present treatise forbids a more extensive detail of the researches upon which the opposing views are founded; I hope, however, that I have succeeded in making clearly prominent, the chief points upon which these contests turn, and thus, in facilitating the formation of a judgment by the reader; and, I have never neglected to indicate the literature from which further instruction is to be derived."

As it is quite impossible to give either an analysis or abstract of the essay introduced to the English reader by the foregoing Preface, we think that we cannot do better than assure our readers that they ought to possess themselves of so valuable a contribution to the science of phyto-physiology. We select for extract a passage on a subject of immediate, although not evanescent, interest. This, while bringing the moot question of cryptogamic reproduction instructively and lucidly before the reader, will also serve as a fair example of the matter and manner of this acceptable volume.

"Propagation of the Cryptogams having Stem and Leaves.—While in the three families of Cryptogamia possessing a thallus (with the exception of the Charas, to be mentioned presently), all attempts to discover male organs have proved the more vain the further the investigation of these plants has advanced, in the more highly organized families of Cryptogamia, on the contrary, in which there exists separation of the organs of vegetation into stem and leaf, the last few years have seen the discovery of convincing proofs of the existence of two sexes.

"In the last century, when Hedwig in particular devoted himself to the investigation of the Cryptogamia, the idea that two sexes must exist in all Cryptogamous plants, was quite predominant; and thus often enough without a trace of consideration, the most diverse parts were, from mere opinion, separated as male organs. This brought the whole effort to discover impregnating organs into discredit, and the opinion that all the Cryptogamia were devoid of male organs, and developed their spores without previous impregnation, became more and more diffused. It is true that organs had been discovered in certain Cryptogamous families, especially the Charas and Mosses, which from the time of their appearance, from their position &c. stood in evident relation to the fruit; but since no positive influence

could be proved to be exerted by them upon the young sporangia, their function as anthers was denied ; although it was at the same time admitted they had a certain analogy with them, whence they were, indeed, called *antheridia*. My own researches, namely, showed that the spores of the higher Cryptogamia do not, as had been previously supposed, exhibit a resemblance in respect to their development and structure, to the seeds of the Phanerogamia, but that the most perfect agreement exists between them and the pollen-grains of the Phanerogamia. From this it necessarily, yet strangely, appeared that organs of perfectly like structure fulfilled the function of germs in one part of the Vegetable Kingdom, and in the other part constituted the male, impregnating organs ; but little as the formation of a pollen-grain depends upon an impregnation, no one circumstance showed itself in the development of the spore, at all more resulting from the co-operation of an impregnating organ. Still more doubtful did the theory of the impregnation of the Cryptogamia necessarily become, when Nägeli made the discovery, in the Ferns, of antheridia in many respects resembling those of the Mosses, which were not formed upon the full-grown plant at the same time as the rudiments of the sporangia, but occurred upon the germ-plant (*pro-embryo*), while the perfect plant was devoid of them.

“ Under these circumstances, Schleiden seemed to be warranted in characterizing the effort to discover impregnating organs in the Cryptogamia, as a mania. But by good luck, certain men who had this mania did not allow it to lead them astray in their researches, and as often happens, nature this time proved so rich that, not indeed was what had been sought found, but instead of this a series of conditions, the existence of which was previously altogether unsuspected. The researches relating to this point are, it is true, still far from their completion, since at the present moment nothing more than a preliminary notice of isolated conclusions already arrived at can be given ; but these, although isolated, cause us to expect with certainty in this field a series of the most striking discoveries.

“ The Mosses have served for a very long period as the main props of the view that two sexes and an impregnation occur in the higher Cryptogamia. Not only was attention naturally called in these to the constant occurrence of the antheridia, and their great development, but trustworthy experience, formerly of Bruch, more recently of Schimper (Rech. s. l. Mousses, 55), demonstrated that Mosses which have antheridia and the rudiments of sporangia upon the same stem always bear fruit, while diœcious Mosses never set fruit in localities

where only female specimens grow. No one has succeeded in making out the mode in which the antheridia act upon the rudimentary fruit; but the physiological fact just mentioned does not lose its force on that account.

“A second family indicating the necessity of an impregnation, were the Rhizocarpeæ, since numerous observations had shown that the large and small spores of these plants could not be separated without preventing the former growing into new plants. Schleiden, indeed, had extended his theory of the development of the embryo from the pollen-tube to this family, and arranged them with Phanerogamia. But nothing was gained by this, for, on the one hand, Schleiden’s whole theory of impregnation proved a false beacon; on the other, Schleiden’s statements as to the Rhizocarpeæ were not confirmed, and this more particularly in the most essential point, the mode of origin of the embryo.

“Then unexpectedly appeared Count Leszcyc-Suminski’s essay on the development of Ferns, the contents of which at first seemed fabulous, so contradictory were they to all that was known of the organization and development of plants. But a more minute study of this treatise—a comparison of the author’s results with nature—soon showed that although he had been deceived in a few particulars, his account was far from being a creation of the fancy, and that his researches had broken open a path to a long series of discoveries.

“In all families of the leafy Cryptogamia (with the exception of the Lycopodiaceæ) antheridia have been discovered, exhibiting, it is true, considerable variations of external form and structure in the different families, but collectively agreeing in the circumstance of developing in their interior very delicately-walled cells, at first containing an amorphous substance coloured yellow by iodine, in place of which, at the epoch of maturation of the antheridia, a delicate filament presents itself, displaying several spiral convolutions, thickened at one end and running off to a very fine point at the other. The filaments manifest lively motions, exhibiting differences according to the manner in which they are rolled up, in some cases while still enclosed in the cells where they are developed, but more particularly after they have emerged into the water from the antheridium, which opens when ripe. Thus, when the filament is rolled up like a watch-spring, the motion is more or less rotatory, but if it is coiled over in the form of a cork-screw, the movement is at the same time an advancing one. In these movements the thin end of the fibre almost always goes first. Minute observation, which in many cases is very difficult, both from

the rapidity of the motion (which, however, is readily arrested by poisons), and the great delicacy of the whole structure, shows that the movements arise from extremely delicate and comparatively long ciliæ, of which two are usually found at the thin end of the filament, and which only seem to occur in larger numbers in the Ferns. The filament itself exhibits no independant motion, as indeed, altogether, the kind of motion does not indicate any will. The term seminal filaments has been not inaply applied to these filaments."—P. 117.

PROCEEDINGS OF SOCIETIES, &c.

BOTANICAL SOCIETY OF LONDON.

Friday, January 7, 1853.—J. D. Salmon, Esq., F.L.S., in the chair.

Donations of British plants were announced from Mr. Hewett C. Watson, Mr. J. T. Syme, Mr. W. L. Notcutt, Mr. I. W. N. Keys, Mr. F. P. Pascoe, Mr. W. H. Purchas, Mr. F. Barnard, Mr. W. Bean, Mr. F. J. A. Hort, Mr. H. D. Geldart, Mr. G. Chambers, Mr. A. Irvine, Mr. T. Moore, Mr. H. O. Stephens, Mr. G. Maw, Mr. J. Whittaker, Mr. G. Brady, Mrs. Atkins, Mrs. Russell, Mrs. James, Mis Barnard, Miss Legge, Miss Griffiths, the Rev. R. C. Douglas, Rev. H. P. Marsham, Rev. T. G. Carter, Rev. T. Butler, Rev. W. M. Hind, Rev. W. R. Crotch, Mr. J. Ward, Mr. B. D. Wardale, Mr. John Ray, Mr. F. Brent, Mr. J. G. Baker, Mr. D. Oliver, and Mr. G. E. Dennes.

Asplenium viride in a Quasi-spontaneous Condition near Brighton.

Mr. Thomas Moore communicated the following paper on this subject :—

"The *Asplenium viride* is chiefly known as a native of the north and north-west parts of England, and of Wales ; and no indication of its spontaneous existence to the southward has, I believe, been made public. I am indebted to the Rev. T. Rooper, of Brighton, for information of its growth in a position which, at least, appears to claim to be quasi-spontaneous, at Danny, about ten miles from that town ; and Mr. Rooper has been so good as to allow me to see specimens gathered at that place, as well as to communicate the following additional particulars :—

“ ‘The fern was found by Mr. Champion, the owner of Danny, on an old brick wall forming a parapet to a cellar-window. The family have never introduced nor cultivated ferns at any period; and the plant would still have escaped notice, as it long has done, had not Mr. Champion’s grandson, a little boy, of twelve years of age, taken a fancy for ferns, which induced Mr. Champion to bring in any he saw, for the amusement of the child, who was in too delicate a state of health to go himself in search of them. Among others, the *Asplenium* was gathered and brought in, without the knowledge of its being rare. I feel satisfied the plant is spontaneous, though its position may make it appear doubtful. Danny is a large Elizabethan house; and the outside walls have not been touched for many years. I have requested the family to cherish the root. There are other ferns growing in the same *locale*, but common to the country, which is rich in ferns, and contains some rather rare species. The *Oreopteris* grows in the vicinity; *Ceterach* and *Trichomanes*, a few miles from it, finer than in any other part of England; and the *Dryopteris* has lately been found not very distant. To these, might be added a long list of more generally dispersed ferns.’ ”

THE PHYTOLOGIST CLUB.

One Hundred and Forty-first Sitting.—Saturday, January 29, 1853.

MR. NEWMAN, President, in the chair.

The President read the following notes, from Mr. J. G. Baker, dated Market Place, Thirsk, January 20, 1853 :—

On the Identity of Hieracium nudicaule of Edmondston with H. murorum, Fries.

“ In the account of an excursion to the banks of the Findhorn, near Forres, in the second volume of the ‘Phytologist’ (Phytol. ii. 184), the late T. Edmondston has described at length an *Hieracium* which he noticed, and proposed it as a novelty, under the specific name of *nudicaule*. It has never been generally accepted by other botanists, or identified with certainty by authors, but is mentioned in the ‘Cybele Britannica’ and the ‘London Catalogue’ as an ambiguous form or species.

“ A portion of one of the specimens collected, for which I am indebted to the kindness of Mr. E. Edwards, has been for some time

in my herbarium ; and I have also had the opportunity of examining a more perfect authenticated example, in the possession of that gentleman. Upon comparing them with a series of *H. murorum*, Fr., collected in Teesdale, and in this neighbourhood, I can have little hesitation in referring them to that species, as identical in all essential characteristics. The specimens of *H. nudicaule*, from the large size and thinness of their leaves, have evidently grown in a very shady place, and belong to the extreme form of var. *sylvaticum*, Fr. (which is the most usual condition of *H. murorum* in this country) ; but some undoubted specimens of the latter resemble it closely in these respects.

“ But, whilst, if we take for granted that this is a correct view of the case, and that *H. murorum* of Fries is the true plant of Linnæus, the use of the name *nudicaule* must be discontinued, in accordance with the recognized law of priority, it is worthy of comment that the opinion of its proposer, that the plant thus designated is specifically distinct from *H. cæsium* (the *H. murorum* of ‘English Botany,’ and wholly or principally of all British authors previous to 1850), has since received the sanction, and has been endorsed by the very high authority, of Fries and Babington ; though it is most likely that Edmondston’s idea of his species was less comprehensive than that of those authors, and that he would not have considered as belonging to it various forms included under *H. murorum* by Fries ; and we may also remark that the name of *nudicaule*, though seldom applicable without qualification, indicates one of the leading distinctions in habit between that species and *H. cæsium*, Fr.”

Hieracium strictum, Fr., in England.

“ Amongst a series of *Hieracia* collected by my friend, John W. Watson, in a tour through Wensleydale, during the autumn, are several specimens of this much misunderstood species, from the neighbourhood of Bolton Castle, on the north bank of the Ure.

“ From the remarks of Messrs. Borrer and Watson in the Supplement to the ‘*Cybele Britannica*’ (iii. 359), it would appear that this species was really known to Smith, and included under his idea of *H. denticulatum* ; but his descriptions would also apply to some of the forms of *H. prenanthoides*, as defined by later British authors, one of which (var. *paucifolium*, Fr.) is figured in ‘English Botany’ (2235), under the name of *denticulatum*. Such being the case, surely it is better to avoid confusion by discarding that name, as loose and uncertain in its application, and using in its place that proposed by

Fries, which has never been employed otherwise than to designate the true *H. denticulatum* of the three editions of Babington's Manual, and is therefore definite, and easily understood.

"Though most probably a permanent species, this is too little known by the botanists of this country for any sketch of its distribution to be attempted. Most likely it will be found, like many others of the same genus, geographically allied to its natural associate, *H. prenanthoides*, and, like that species, attain its southern limit in super-agrarian Yorkshire. It has been so much mixed up with other species, that it is impossible to speak with certainty; but I believe this is the first notice of its occurrence in England."

Correction of a previous Error.

"I am kindly informed by Mr. H. C. Watson, that the *Serrafalcus* so plentiful, last autumn, on the Middlesbro' ballast-hills, as mentioned in a former number (Phytol. iv. 721), is probably rather *arvensis* than *patulus*. The two species are very nearly allied in habit; but the latter is described as distinguished by its broader spikelets, unequal paleæ, and shorter anthers. It is practically known to few botanists as a plant of Britain. Another species, closely resembling that which I collected, is reported to occur occasionally on ballast at the same locality. Perhaps that may be true *patulus*: also *Digitaria humifusa*; but I have not been able to find either of them. I may also take this opportunity of mentioning, that, upon receiving specimens of the mosses, collected with *Cyperus fuscus* at the Codhill locality, I find the *Hypnum* named *nitens* is really *rufescens*, a species more boreal in its localities."

Effects of the Mildness of the present Season.

The President read the following note, from Mr. John Lloyd, dated Wandsworth, January 24, 1853:—

"The annexed list of British plants have all of them been observed in bloom, by myself, since the 1st of the present January, and, with very few exceptions, in the neighbourhood of Clapham and Wandsworth, where the soil is light, and the subsoil gravel. Some of them are cultivated; but they will be found to be such as have their habitats in warm, sheltered situations, where we may reasonably expect that they are in bloom at the present time. I have rejected all cultivated alpine, for, although many of them are in bloom here, we cannot expect that they are so in their mountain homes, where the surface of the ground is probably covered with snow. It will be seen that it

is more like a list of autumnal plants protracted in their blooming, than of vernal ones which have come prematurely into flower. In elucidation of this view, I may observe that a considerable number of the plants belong to the Compositæ, and the greater part of this order are autumnal; and I may also mention that, in the large open field opposite to the burying-ground at Wandsworth, there was, at the beginning of the month, a great number of *Ranunculus bulbosus* in bloom; but these have gradually decreased to the present time. By the side of the same field, on a sheltered bank, *Ranunculus Ficaria* grows; but, although this is one of our earliest plants, and a purely vernal one, it is not yet in bloom.

“The present season may be considered as the mildest since the commencement of the present century; and I can only find one instance of anything like it in the records of the last. The Rev. Stephen Hale, in his ‘*Statical Essays*,’ fourth edition, 1769, vol. i. p. 69, publishes an account (which he had from Philip Miller) of the winter of 1724, in which occurs the following paragraph:—‘The Spring was so forward in January that the Snowdrops, Crocus’s, Poleyanthus’s, Hepatica’s, and Narcissus’s were in flower, and it was remarkable that most of the Cauliflower Plants were destroyed by the mildew.’ Now, I think we may infer from this, that the weather was something like what we are experiencing in the present season, for, if there had been a few sharp frosts in November or December, 1723, the mildew would have been materially checked, if not destroyed.

“ <i>Ranunculus bulbosus</i>	<i>Geranium rotundifolium</i>
„ <i>repens</i>	* „ <i>nodosum</i>
* <i>Alyssum maritimum</i>	<i>Ulex europæus</i>
<i>Capsella Bursa-pastoris</i>	„ <i>nanus</i>
* <i>Brassica oleracea</i> , var. <i>Cape broccoli</i>	<i>Æthusa Cynapium</i>
<i>Sinapis arvensis</i>	<i>Anthriscus sylvestris</i>
<i>Raphanus Raphanistrum</i>	<i>Galium Aparine</i>
<i>Sisymbrium officinale</i>	<i>Erigeron Canadensis</i>
* <i>Cheiranthus Cheiri</i>	<i>Senecio vulgaris</i>
* <i>Viola odorata</i>	„ <i>Jacobæa</i>
„ <i>tricolor</i>	<i>Bellis perennis</i>
<i>Malva sylvestris</i>	<i>Chrysanthemum Parthenium</i>
<i>Cerastium vulgatum</i>	<i>Anthemis Cotula</i>
<i>Stellaria media</i>	„ <i>nobilis</i>
* <i>Hypericum calycinum</i>	<i>Achillea Millefolium</i>
<i>Arenaria rubra</i>	<i>Sonchus oleraceus</i>
<i>Geranium molle</i>	<i>Leontodon Taraxacum</i>

Hieracium Pilosella
Hypochæris glabra
 „ *radicata*
Cichorium Intybus
 **Fragaria vesca*
Borago officinalis
 **Pulmonaria officinalis*
Plantago major
 **Arbutus Unedo*
Vinca major
 „ *minor*
 **Primula vulgaris*
Anagallis arvensis
Veronica agrestis
 „ *arvensis*
 „ *hederæfolia*
Linaria Cymbalaria

Lamium album
 „ *purpureum*
 * „ *maculatum*
 „ *incisum*
 **Daphne Mezereum*
 * „ *Laureola*
Rumex Acetosella
Urtica urens
Euphorbia helioscopia
 „ *Peplus*
Mercurialis annua
 **Corylus Avellana*
Ruscus aculeatus
Poa annua
Hordeum murinum
 **Galanthus nivalis*
 (67 species).”

The following remarks, by Dr. Salter, in a letter in the ‘Isle of Wight Observer,’ refer to the same subject:—

“At the present time, the effects of the mildness of the temperature on the vegetable kingdom are yet more remarkable than on the animal. For nearly a month past, primroses have been blossoming on the banks, and the green-swards have been bespangled with daisies, while *Ulex europæus* is getting quite yellow with the abundance of bloom. Not to dwell particularly on each, I would enumerate the following, which, within the last few days, I have observed in flower in the fields, woods, and hedges, *viz.*, *Ficaria verna*, several species of *Ranunculus*, *Sinapis arvensis*, *Cardamine hirsuta*, *Lychnis diurna*, *Stellaria holostea*, *S. media*, *Arenaria trinervis*, *Cerastium viscosum*, *Fragaria vesca*, *Potentilla Fragariastrum*, *Heracleum Sphondylium*, *Torilis Anthriscus*, *Sonchus arvensis*, *Lapsana communis*, *Pyrethrum inodorum*, several species of *Senecio*, *Anagallis arvensis*, and *Linum angustifolium*. Of shrubs and trees I may state that the honeysuckle and elder are in leaf. In one hedge I saw a few hawthorn-leaves; here and there was one bush which had sprouted to the length of three inches. The oaks, elms, and hazels have already an altered tint, from the swelling of their buds. On the banks, the leaves of the wild *Arum* are already developed; and in the hedges *Rubia peregrina* is grown to several inches.

“In the gardens, there are in blossom several varieties of roses; also *Arbutus*, *Laurus-tinus*, *Coronilla*, a species of *Acacia*, violets (double and single), daffodils, periwinkles, anemonies, *Hepatica*, snow-drop, stock, scarlet geranium (*Pelargonium*), *Omphalodes verna*, mignonette, *Petasites fragrans*, *Sphenogyne speciosa*, scabious, and

others. Fuchsias and *Eccremocarpus* are sprouting; and the *Clematis* in many instances has grown more than a foot in length. Potatoes are in many places a foot in height, and *Tropæolum* continues growing. In a pond about a mile from Ryde, that rare, and beautiful, and deliciously scented aquatic, *Aponogeton distachyon*, is at present blooming to perfection.

“It is, I think, usual in this district, for many of the above to sprout, and occasionally to bloom, in winter; but I never before knew vegetation quite so active as it is at this season.”

MICROSCOPICAL SOCIETY OF LONDON.

October 27, 1852.—George Busk, Esq., in the chair.

A paper by Joseph Delves, Esq., ‘On the Application of Photography to the Representation of Microscopic Objects,’ was read.

After some preliminary observations, the author stated that the only arrangement necessary for the purposes of photography is the addition to the microscope of a dark chamber, similar to that of the camera obscura, having at one end an aperture for the insertion of the eyepiece, and at the other a groove for carrying the ground glass plate. This dark chamber should not exceed eighteen inches in length, as, if longer, the pencil of light transmitted by the object-glass is diffused over too large a surface; and a faint and unsatisfactory picture is the result. Another advantage is, that pictures at this distance are in size very nearly equal to the object as seen in the microscope. The time of producing the picture varies from five to fifteen seconds. The author also made some remarks upon the mode of manipulating, and concluded by calling attention to some very beautiful specimens that were afterwards presented to the Society.

Errata in a previous Number.

Mr. Maw wished to have the following errors corrected, which occur in his paper at page 785:—Page 785, line 8 from bottom, for “at” read “of;” page 786, line 4 from bottom, for “areas” read “axis;” page 787, line 6 from top, for “entering” read “resting;” page 792, line 20 from top, for “Forthelsloch” read “Frithelstock;” page 794, line 13 from top, for “Witham” read “Northam;” page 794, line 14 from bottom, for “Barnstaple” read “Bideford.”

Extracts from the 'Proceedings of the Linnean Society.'

(Continued from page 832).

On the Forest-Trees of British Guiana, and their Uses in Naval and Civil Architecture ; by Sir Robert H. Schomburgk, Ph.D. &c.

The trees are mostly indicated by their colonial names, but to many of them Sir R. Schomburgk has been enabled to add their scientific designation.

Souari, Sewarri or Sewarra (*Pekea tuberculosa, Aubl.*). Of large size and very abundant ; excellent for ship-building, mill-timber and planks, and may be obtained from 20 to 40 feet long, and from 16 to 20 inches square.

Siruaballi, Sirwaballi, Siverballi. There are four varieties or perhaps species of this tree, which belongs to the family of Laurineæ. They are distinguished as black, brown, yellow and white Siruaballi. Its spicy smell and bitter taste preserve it from the attacks of worms, either in or out of water, on which account it is in great request for planking colonial crafts.

Dakumballi. Grows on the side of rivers, and is not much used.

Marsiballi or Accuribroed. A tall straight tree, but not of large size. Wood hard and strong, but not very durable when exposed to alternations of wet and dry weather, for which reason it is only used in house-framing and inside work. When dried it is frequently used for torches.

Turanira or Bastard Bully-tree. Tall, straight, of large size, and abundant on the banks of the Demerara River. Makes good planks and framing-timbers for inside work, but is not durable when exposed to the weather.

Suradani or Suridani. Plentiful and of large size ; principally in request for planks and timbers of colony crafts. It is of a light red colour.

Kautaballi or Kutaballi. Grows chiefly on the sand-hills which form the first elevations on receding from the sea-coast. Very hard, and much used for beams and inside work, but not durable when exposed to the weather.

Cakaralli or Kukaralli. Mostly found on rising ground along the banks of rivers, and belongs to the tribe of Lecythideæ. Its straightness and large size (from 30 to 40 feet long and from 6 to 14 inches square) would qualify it for masts or spars for colony crafts ; but its

heaviness militates against this use. It is very durable and chiefly used in house-framing; but as it is said that barnacles do not attack it, it is also employed in wharfs, &c. The bark is easily stripped off, and consists of numerous layers, which the Indians separate by beating with a stick, and the author has counted as many as seventy of these layers in a strip of bark. When separated they have the appearance of thin satin paper; they are dried in the sun, and used as wrappers for cigars.

Simaruba, or *Sumaruppa* (*Simarouba amara*, *Aubl.*). Grows on hill-sides to the height of 50 feet, branching and somewhat crooked. The wood resembles white pine, both in colour and quality, and makes good boards for inside work. A decoction of the bark, which is intensely bitter, is considered an excellent remedy in dysentery and other complaints of the bowels, and is much used among the Indians.

Yahou. Grows in valleys in rich soil, and is much used for the staves of casks, &c.

Wallaba (*Eperua falcata*, *Aubl.*). In great abundance along the banks of rivers, reaching 40 feet in height, and being often 2 feet in diameter. Bark reddish brown, with a thin white sap, enclosing a wood of a deep red colour frequently variegated with whitish streaks. It is hard, heavy and shining, and impregnated with an oily resin, which makes it very durable both in and out of water. It splits very easily, and is consequently generally used for palings, shingles and vat-staves, and also for posts and uprights in framing. The bark, which is somewhat bitter, is a good emetic, which is much used by the Arawak Indians in a decoction.

Curahuri or *Kuruhuru*. Tall and straight. Wood used for framing, boards and planks.

Curana, *Samaria*, *Acuyari*, *Mara*, or *Cedar-Wood* (*Icica altissima*, *Aubl.*); two varieties, as they are considered by Aublet, one having red wood and the other white. The red cedar is found only in the interior, growing to 60 or 70 feet and even higher, and from 4 to 5 feet in diameter. It has a strong aromatic smell, and is much in request for inside furnishing, bookcases and shelves, as it is found to preserve books and papers from injury by insects, and is also light, easily worked and not liable to split. Its great height would qualify it for masts, and the Indians prefer its trunk to that of any other tree for preparing their canoes. One of those employed by the author during an expedition into the interior, which was 42 feet long and 5½ feet wide, was hollowed out of a single trunk of this tree, and was

found at the end of four years' service, having previously been much used, to be as sound as when bought for the expedition, although it had been in both fresh and salt water, and hauled over land and cataracts in the interval.

Itaballi or *Copai-yé* of the Macusi Indians (Vochy Guianensis, *Aubl.*). From 50 to 60 feet high, and from 2 to $2\frac{1}{2}$ feet in diameter. Wood hard, but not very durable when exposed to the weather; chiefly used for inside work, staves for sugar-hogsheads, boat-oars, &c. Flowers of a beautiful yellow, highly odoriferous and very ornamental.

White Siruaballi. A tall tree; wood much lighter than the brown Siruaballi previously mentioned, but not so much esteemed.

Curata-yé of the Macusis (*Curatella Americana, L.*). A crooked tree, seldom more than 12 feet high, with crooked and tortuous branches, and a thick rough bark which frequently peels off in large flakes. The crooked branches are much used by the Indians for their canoes, and might serve for military saddles. It grows only in the Savannas of the interior. The leaves, which are scabrous, are used by the Indians like sand-paper to polish their blow-pipes, bows, war-clubs, &c.; and the blow-pipe being called *Cura*, the tree has thence received the name of *Curatakié*.

Burracurra, Paira, Letter-wood, or Snakewood (Piritanera Guianensis, *Aubl.*). This tree, which is very scarce within several hundred miles of the sea-coast, is often from 60 to 70 feet high, and from 2 to 3 in diameter. The bark is of a dark gray, and when wounded exudes a white milk. The outer part of the wood is white and very hard; the heart (which in the largest tree scarcely exceeds 6 or 7 inches in diameter) is of great weight, hardness and solidity, of a beautiful deep red, variegated with black spots of different size and figure, which give rise to its name. It is susceptible of a brilliant polish; but the small size of the mottled part, and its great value even in the colony, limits its use almost entirely to veneering, to picture-frames, to some smaller pieces of furniture, and to walking-sticks. The Indians form it into bows more for ornament than use. At the foot of the Canuku Mountains near the river Rupununi, at the Upper Essequibo, and Corentyn, it is still plentiful; but all these places being several hundred miles from the sea-coast, it is both difficult and expensive to convey it to the colony. There appears to be a variety, the heart of which is not mottled, and this the Indians are said to prefer to the other for their bows.

Wamara. A scarce tree, attaining a great height, but the only

part used is the heart, which is dark brown and often streaked. Its hardness and weight cause it to be preferred by the Indians for their war-clubs; it may be had from 6 to 12 inches square, and from 20 to 40 feet long.

Cuppa, Ruyé (*Clusia* sp.?). A tree of large size, with a hard wood used for inside work.

Curahara or *Kurara*. Plentiful and of large size; and its durability, and not being liable to split, recommend it chiefly for timbers, knees, &c. for schooners. It is also much in request for mill-rollers, mill-timbers and planks of every description.

Yarura, Porreka-yé, or Paddle-wood (*Aspidosperma excelsum, Benth.*). The lower part of the trunk juts out in tabular projections, forming cavities or compartments like the *Mora*, which serve the Indians as ready-made planks, principally for the construction of their paddles. The trunk itself has the appearance of being fluted, or as if it consisted of numerous slender trees grown together along their whole length. The author states that he knows only of one other similar instance among the forest-trees of British Guiana; in this latter case the tree produces berries, while the fruit of the *Yarura* is a follicle containing several suborbiculate winged seeds, attached by a long funiculus. The wood of the *Yarura* is light, elastic, and not apt to splinter; it might prove useful for gun-carriages, bulwarks of vessels of war, &c.; and might also, on account of its lightness, be employed in floats or paddle-wheels of steam-vessels. It is much in request for rollers in the cotton-ginning machines, for which purpose it is superior to any other wood in the colony.

Purple-heart, or Mariwayana (*Copaifera pubiflora, Benth., and Cop. bracteata, Benth.*). Rather scarce in the Coast Region, being found in the mountainous tracts above the Cataracts. There are several varieties or species, but all much alike, possessing great strength and elasticity, and used for furniture, on account both of their colour and durability. Used also for mortar-beds, being superior to any other wood in sustaining the shocks produced by the discharge of artillery. The author was assured by Col. Moody, R.E., that the Black Green-heart and the Purple-heart were the only woods that stood the test as mortar-beds at the siege of Fort Bourbon, in the Island of Martinique. One variety (*Cop. bracteata*) is very common in the Savannahs near the rivers Rupununi, Takutu, and Branco; but this is of small size compared with the others. The natives use the bark taken off entire with the ends sewn together, and strengthened by a slight frame-work, for river canoes.

Mapurakuni, or *Maipayé*. The bark is used by the Indians for colouring their arrow-points and pottery, as it produces a fine red colour when steeped in water and mixed with Currawéru. It is a large forest-tree.

Burueh, *Bully*, or *Bullet-tree* (*Mimusops* sp.). A tree of the largest size, often 6 feet in diameter, and having the trunk destitute of branches nearly to the top. Leaves, branches and trunk producing a whitish milk; fruits the size of a coffee-berry, and when ripe very delicious. Wood extremely solid, heavy, close-grained and durable; dark brown, variegated with small white specks; chiefly used in house-framing, for posts, floors, &c., as the weather has but little influence on it, but also esteemed the most valuable timber for the arms, shafts, &c. of windmills. It squares from 20 to 30 inches, and may be obtained from 30 to 60 feet long. In salt or brackish water it is sure to be attacked by the worms. A tree cut down by the author at Cuyuni, measured 67 feet to the first branches, and thence to the top 49 feet—in all 116 feet.

Payou-yeh (*Etaballia Guianensis*, *Benth.*). A tree growing only near the Upper Essequibo and very abundantly along the Rupununi and Takutu, the heart of which is highly ornamental, but not more than 6 inches in diameter, and very subject to holes.

Maipurému (*Vantanea Guianensis*, *Aubl.*). Wood very subject to worms, and not likely to become of much use; but the tree presents a beautiful appearance with its large clusters of pink flowers, and is even more remarkable for its drupaceous fruit, which is furrowed like our peaches and almonds, and is cut in half by the Indians to form ornaments, chiefly for the children.

Camara, *Camacusack*, *Makoripong*, or *Ackawai-Nutmeg* (*Acroclidium Camara*, *Schomb.*). Timber most like the Siruaballis, aromatic and bitter, and consequently resisting worms and insects. Trunk 40 or 50 feet high, with a circumference of 8 to 10 feet, and apt (like the Yarura and Mora) to form tabular projections at the lower part. Chiefly prized for its aromatic fruit, which is considered one of the most efficacious remedies in colic, diarrhœa and dysentery.

Greenheart, *Sipiri* (*Nectandra Rodiæi*, *Schomb.*). The brown Greenheart is one of the most useful timber-trees of the colony, and is found in great abundance within 100 miles of the Coast Region. It grows to the height of about 60 feet, and is generally used for house-frames, wharfs, bridges, piles and planks. Within the last twenty years a large quantity has been imported into Liverpool and Greenock; and it has been even asserted that in strength and durability it is

superior to English oak, than which it commands a higher price. In times of scarcity the Indians obtain from its fruit, grated and macerated in water, a fecula which is mixed with the rotten wood of the Wallaba-tree, pounded, sifted and baked into bread, in like manner with the Cassava. In the bark and also in the fruit, Dr. Rodie of Demerara has discovered a substance which forms an excellent substitute for quinine, and to which he has given the name of *biberine*. The black greenheart appears to be a mere variety.

Cartan-yeh of the Macusi Indians, *Pao da Rainha* of the Brazilians. Apparently restricted to the Savannahs in the neighbourhood of the rivers Rupununi, Takutu, Branco, &c. The Brazilian name is derived from the red colour of the wood, which resembles that of the Brazil-wood of Pernambuco, to which the same name (Queen's-wood) is applied. It reaches a height of 80 to 100 feet; and being easily worked and of a handsome colour, promises to become of great interest to cabinet-makers. It was used by the author during his sojourn in Pirara for temporary tables, and the large size of its planks induced the military commandant to construct of it a temporary bridge across the river. The leaves are impari-pinnate, the flowers papilionaceous, and the fruit a samara with a prickly capsule, the wing being from 4 to 5 inches in length.

Sarabadani. Much used for furniture. It grows to a large size, and is chiefly found in swampy soil and along the banks of rivers.

Ducaballi, or *Guiana-Mahogany*, is very scarce, and is almost regarded as superior to mahogany, whence it is chiefly employed for furniture and commands a high price.

Waranana, or *Wild Orange*. A large timber-tree, which grows chiefly along the banks of the rivers Pomeroon, Supinama, &c. Much used for boat-oars and staves for sugar-hogsheads. Its fruit resembles an orange, but is not eatable.

Ducaliballi. Grows to a pretty large size, but is not plentiful; the trunk is about 40 feet high, but seldom exceeds 20 inches in diameter. Wood deep red, finer, more equal and more compact than mahogany, and like the *Ducaballi* much used for furniture. Takes a fine high polish, and resembles or perhaps is identical with the Brazilian Beef-wood.

Haiawaballi, or *Zebra-wood* (*Omphalobium Lamberti*, Dec.). Grows to a large size, but is very scarce. Wood of a light brown with darker stripes, and considered the handsomest furniture-wood of the colony: it is easily worked and makes beautiful bed-posts.

Hubaballi. A light brownish wood, beautifully variegated with

black and brown streaks; easily worked, takes a fine high polish, and makes beautiful furniture, and cabinet-work of every description. May be had from 6 to 15 inches square and from 20 to 35 feet long. It is by no means scarce, but is much subject to holes, which frequently render it useless.

Simeri, or *Locust-tree* (*Hymenæa Courbaril*, L.). A tree of large size and plentiful throughout Guiana, often attaining from 60 to 80 feet in height and 8 to 9 feet in diameter. Trunk destitute of branches nearly to the top. Wood close-grained, of a fine brown, streaked with veins, and well adapted for mill-timbers, as it does not split or warp. A good deal of it is sent to England to be used as trenails in planking vessels, and in beams and planks for fitting up steam-engines: it has also been found to answer well for the frames, wheels, &c. of spinning machines. The Indians and Negroes are fond of the farinaceous saccharine pulp enveloping the seeds. The gum, which resembles Copal, and produces an excellent spirit-varnish, is found about the roots of the old trees a few inches under the surface of the ground, and occasionally also exuding from the trunk.

Yari-Yari or *Lance-wood* (*Duguetia Quitarensis*). Is abundant in the interior; but the trees are seldom above 20 feet high clear of the branches, or more than 5 inches in diameter. It is considered by the coach-makers, in consequence of its elasticity and toughness, the best material for chaise or gig shafts.

Black Greenheart is only distinguished from the common Greenheart by the colour of the wood, but is so scarce in proportion to the brown, that not more than one in twenty of the trees cut down are found to belong to this variety. The wood is in great request in the island, being preferred to all others, on account of its well-known durability, for windmill-shafts, spindles and mill-work in general.

Itaka or *Itekitibouraballi* (*Machærium Schomburgkii*, Benth.). Wood much used for furniture: it has streaks of black and brown throughout, the outer part being pale yellow. It is not scarce, but rarely squares to more than 14 inches, and is very subject to heart-shakes. Its purple flowers have the odour of violets.

Ebony, or *Banya*. A large tree of fluted surface and uneven growth, the heart of which (seldom more than 8 to 10 inches square) is alone used: it is black, heavy, hard, and strong, and generally used by the Indians for their war-clubs.

Mora (*Mora excelsa*, Benth.). The most majestic tree of the forests of Guiana, towering over all the rest and often reaching the height of 120 feet. It is abundant along the rivers of the Coast Region, and

extends as far south as lat. 3° N. The wood is close, cross-grained, and difficult to split: it is considered by the most competent judges to be superior to oak (as it is not subject to dry-rot) and the very best wood that can be procured for ships' timbers. It may be obtained from 10 to 20 inches square, and from 30 to 40 feet long; and its branches having a tendency to grow crooked it affords natural knees, while the trunk may be used for keels, beams and planking. A full account of this useful tree was published by Mr. Bentham in the Society's 'Transactions,' vol. xviii. p. 207.

Note on the Occurrence of an Eatable Nostoc in the Arctic Regions and in the Mountains of Central Asia; by J. D. Hooker, M.D., F.R.S., F.L.S. &c.

Dr. Hooker states that on the return of Captain Penny's Expedition from the Arctic Regions, Sir W. Hooker received from Mr. Sutherland a small collection of Cryptogamic plants, among which was one, apparently referable to *Nostoc commune*, which he described as being found in great abundance upon the floating and fixed ice in Wellington Channel, occurring in detached masses drifted about by the wind, forming the only vegetable production of any importance over many square leagues, and affording shelter to *Poduræ*, with other Crustacea and some insects. In the neighbourhood of their winter quarters on Cornwallis Island, lat. 75° N., long. 95° W., it was so plentiful that it might be taken advantage of as food, and prove a material addition to the resources of the country in cases of extreme want. Mr. Sutherland added that he had eaten handfuls of it on several occasions, without any inconvenience; and although it was generally infested with swarms of the larvæ of flies and gnats, as well as with myriads of very active *Poduræ*, he considered it much more nutritious and agreeable than the "*tripe de roche*," and perhaps not inferior to "Iceland Moss." On showing the plant to Dr. Thompson, he drew the attention of Dr. Hooker to a very similar plant which occurs in great abundance in Western Thibet, floating in large masses on the surface of pools and lakes in soils impregnated with carbonate of soda, and of which heaps are drifted by the winds upon their banks. It occurs as high up as 17,000 feet, and is of a green or pale purple colour; and this too appeared to Dr. Hooker to belong to *Nostoc commune*. Samples of both were forwarded to Mr. Berkeley, whose notes to the following effect were also laid before the Society.

Mr. Berkeley states that he has been unable to find any account of the chemical constituents of *Nostoc*. The chemical condition of such species as he had been enabled to examine, under the influence of iodine and sulphuric acid, seems to vary not only in the different species, but in individual specimens, and even in parts of the same specimen. In some the gelatinous matter and the chains of spores assume a more or less deep tint of violet, indicating that the greater portion consists of cellulose, perhaps in some cases partially changed to dextrine by the action of the sulphuric acid; while in other cases the prevailing tint is yellow-brown, indicating rather bassorin. No purple tint occurs where merely iodine is used, and the change therefore is not due to the presence of amylum. In fresh specimens of *Nostoc commune*, the spores assume a beautiful green tint, which is probably due to the combined tint of the yellow protein contents of the cells and the blue cellulose of which their wall is formed. In the Arctic specimens, and in English *Nostoc commune*, the bassorin tint prevails, while in specimens from Thibet (probably *Nostoc salsum*, *Kütz.*), gathered by Dr. Thomson, in pools of water where the soil is covered with an efflorescence of carbonate of soda, cellulose is indicated, but with every intermediate shade. Mr. Berkeley has, however, found that in woody fibres which in bleaching have been exposed to salt water, a deeper purple tint is assumed than when they have been bleached by rain water, so that something may possibly be due to the peculiar place of growth of the Thibetan species. In *Nostoc edule* the yellow-brown tint is stronger than in any other specimen examined; but it is scarcely probable that any very constant chemical characters will be found to prevail in the different species. In either case there would be a very nutritious food, and one from its gelatinous condition probably easily assimilated. The habit of the Arctic species is exactly that of *Nostoc commune*, and Mr. Berkeley would not hesitate to regard it as identical, if there were no other difference than a little increase in the relative size of the threads of spores; but in parts of the fronds the chains are surrounded by a distinct gelatinous envelope, presenting an appearance somewhat similar to that of toad-spawn, which is very visible in a transverse section. At a later period, when the chains are ready to break up at the connecting joints, no trace of this envelope is to be detected, and the plant then exhibits the true characters of *Nostoc*. It appears indeed, from the remarks of Thuret, that when the threads of *Nostoc* are first generated from the large connecting bodies, there is really such an envelope; but this exists in *Nostoc*, as far as is at present known,

merely in the infant state ; and consequently if the genus *Hormosiphon* is to be retained, the Arctic species must be regarded as belonging to it, for no such appearance has been detected by Mr. Berkeley either in dried or freshly-gathered specimens of *Nostoc commune*. It is possible that more extended observation may show that this character is not of the consequence attributed to it by Kützing ; but in the mean time Mr. Berkeley characterizes these specimens as—

HORMOSIPHON ARCTICUS, foliaceo-plicatus viridis vel fuscescens, filis demum (gelatinâ diffusâ) liberis.

Fronds foliaceous, variously plicate, sometimes contracted into a little ball. Gelatinous envelope at length effused ; connecting cells at first solitary, then three together ; threads (which are nearly twice as thick as in *Nostoc commune*) breaking up at the connecting cells, so as to form two new threads, each terminated with a single large cell, the central cell becoming free. Of these threads and of their gelatinous envelope Mr. Berkeley gives figures.

With regard to the Thibetan *Nostoc*, Mr. Berkeley adds that a species of this genus, as is well known, is a native of Tartary and is eaten abundantly in China. There is a box of it, sent by Mr. Tradescant Lay, in the Museum of the Linnean Society ; and mention is made of it by M. Montagne in the ‘*Revue Botanique*,’ ii. p. 247, as having, in the form of a soup, made part of a dinner given by the Mandarin Huang at Macao, to several members of the French Embassy. The Mandarin described it as a freshwater plant, growing in Tartary in streams and running water, and sold at Canton in small boxes : it is highly esteemed by the Chinese, and not very expensive. At this time M. Montagne regarded the species as *Nostoc cæruleum*, but specimens sent him by Mr. Berkeley proved it to be distinct, and it was afterwards published in the ‘*Revue Botanique*’ under the name of *Nostoc edule*, *Berk.* and *Mont.*, and figured by Kützing in his ‘*Tabulæ Phytologicæ*.’ In the last-named author’s ‘*Species Algarum*,’ it is said to have been gathered by Gaudichaud, who, although a great traveller, was certainly never in Tartary. The Thibetan *Nostoc*, like the Arctic, is probably quite as good as the Tartarian. After some further notes on the chemical changes produced in this plant and in *Nostoc commune* when treated with iodine and sulphuric acid, and a reference to a passage in Kützing’s ‘*Grundzüge der Philosophische Botanik*,’ where he speaks of these plants as consisting in great measure of gelatin (a substance belonging to the same category as bassorin, and perhaps a modification of it), Mr. Berkeley concludes

by stating that a thin slice of gum tragacanth, treated with iodine and sulphuric acid, assumes after a time the same tint as the Nostoc. He believes, however, that starch is often present in gum tragacanth, which is not likely to be the case with the Nostoc; and thinks we may safely assume the jelly of Nostoc to be a state of bassorin, passing into cellulose or dextrine.

Localities for Plants near London, in 1852.

By J. T. SYME, Esq.*

LAST summer I had an opportunity of examining pretty carefully the Flora of the metropolitan district, as I devoted to this object the three days of the week on which I was not engaged at the rooms of the Botanical Society. I shall now bring forward the results of these excursions, as I think they may be interesting, on account of the verification I have been able to afford to stations for rare plants which have not, I believe, been recorded on recent authority. Of course, plants *new* to the district were scarcely to be hoped for; and the few I shall mention are critical species, which have no doubt been passed by as allied and well-known species.

Ranunculus fluitans, Lam. Plentiful in the Wey, at Godalming.

Ranunculus cœnosus, Guss. On Woking Common, in some of the ponds made in excavating material for the approaches to the bridges over the Basingstoke Canal.

Ranunculus hirsutus, Curt. Very luxuriant on the Plumstead practice-ground, at the station for the Polypogons.

Papaver somniferum, L. Plentiful, as a weed, in corn-fields near Greenhithe; Boxley, and between Halling and Cobham.

Fumaria micrantha, Log. Near Northfleet; Epsom.

Fumaria parviflora, Lam. Cuxton; Halling; Boxley.

Fumaria Vaillantii, Lois. A single specimen on the Hogsback, near Compton chalk-quarries, Surrey.

Brassica Napus. Very abundant on the bank of the Thames, from Putney upwards. My reason for mentioning this plant is, that *B. campestris*, which I could not find, is said to grow there. Is this a mistake? The plants are very difficult to distinguish, unless the root-leaves are examined. These are quite glabrous in the Thames-side plant.

* Read before the Botanical Society of London, February 4, 1853.

Polygala calcarea, Schultz. Very fine near Pangbourne, Berks; not unfrequent on the Hogsback, at and near Compton chalk-quarries. Flowers *blue, white, or pink*.

Geranium rotundifolium, L. Abundant in one locality at Battersea.

Trigonella ornithopodioides, D.C. Plumstead Common, scarce.

Poterium muricatum, Spach. Near Goring, Oxfordshire.

Sedum sexangulare, L. Garden-wall at Sydenham, of course not indigenous.

Petroselinum segetum, Koch. Lane at Charlton Church; near Eltham; between Greenwich and Woolwich; and near Orpington.

Coriandrum sativum, L. Thames-side below Greenwich. Mr. Irvine found it at Battersea and Wandsworth.

Tragopogon pratensis, L. With florets *exceeding* the phyllaries, at Sydenham. At Greenwich it occurs with florets equal to, and half the length of, the phyllaries, and in all intermediate states. *T. minor*, Fr., can scarcely be separated, even as a variety.

Lactuca virosa, L. Between Greenhithe and Darenth Wood.

Sonchus palustris, L. I searched in vain for this fine species in the Isle of Dogs, and between Greenwich and Woolwich. Mr. Irvine and I failed to find it at Halling, where the former saw it many years ago. Mr. Irvine could not see it in the railway cutting on Wandsworth Common, where it is recorded by Mr. M'Ennes (Phytol. iv. 398). Mr. Kippist informs me he found it, in 1829, about Deptford, and it may still grow there. If not, I fear it must be expunged from the metropolitan Flora.

Crepis biennis, L. Northfleet and Greenhithe chalk-pits; near Cobham, Rainham, Rochester, and Gravesend.

Hieracium vulgatum, Fr. The form called *H. maculatum* by Smith occurs on a wall at Sydenham.

Borkhausia foetida, D.C. I looked very carefully for this plant in the stations recorded for it, but in vain. I fear it is now extinct. The following species has probably been mistaken for it in some of the localities given for it.

Borkhausia taraxacifolia, D.C. Very abundant in all the chalky districts of Kent.

Carduus acaulis, L. Specimens from the road-side between Darenth and Dartford had branched stems above a foot high.

Pulicaria vulgaris, Gærtn. Has disappeared from Golder's Green, where it was carefully sought for, by Mr. Irvine and myself.

Verbascum nigro-Lychnitis. At Green-street, Green, near Farnborough, Kent, along with *V. nigrum* and *V. Lychnitis*. *V. Lychnitis* also occurs near Cuxton.

Linaria vulgaris, var. *speciosa*, Ten. A plant agreeing pretty nearly with that found in the Isle of Wight by the late Dr. Bromfield, grows in a chalk-pit near Northfleet.

Melissa officinalis. L. Between Richmond and Kew, in considerable quantity.

Lithospermum purpureo-cæruleum, L. In an excursion to Darenth Wood, last July, Dr. J. A. Power and I found this plant in considerable abundance, but mostly without any signs of having flowered.

Chenopodium rubrum, L. A prostrate form, with entire leaves and large seeds, is common below Gravesend. This is probably the same as that found by the Rev. W. A. Leighton, recorded in the 'Manual of British Botany.'

Chenopodium hybridum, L. Still abundant near Northfleet; Charlton; Battersea.

Chenopodium ficifolium, Sm. Very plentiful near Notting Hill; Battersea; Greenwich. In 1850 I saw it about Hampstead.

Atriplex littoralis, L., and *A. marina*, L. The former below Gravesend, and the latter all along the banks of the Thames from Greenhithe to Stroud. There seems to be no character by which these plants can be distinguished, except the leaves, as open and closed perigones occur on the same specimen.

Polygonum mite, Schrank. Battersea. Here I also found a plant intermediate between *P. mite* and *P. Persicaria*.

Rumex pratensis, M. & K. Near Cuxton, Kent; about Thames Ditton and Moulsey, Surrey; between Hampstead and Camden Town.

Rumex maritimus, L. Putney Heath; Battersea fields? on the mud taken from the bed of the river; (the plant was rather too young to be determined quite satisfactorily).

Rumex palustris, Sm. Still grows at Hampstead; Notting Hill; Isle of Dogs; Battersea; Thames-side near Charlton.

Populus canescens, Sm. Epping Forest, at Wanstead.

Orchis militaris, L. This fine species still grows, but very sparingly, between Pangbourne and Streatly, Berks.

Orchis simia, Lam. Edges of fields between Goring and Mapledurham, Oxfordshire. Babington says, "*Helmet dark purplish*." It was pure white in all the specimens I found. Neither this nor *O. militaris* appears now to grow in the vicinity of Cavesham.

Leucojum æstivum, L. Last autumn, on passing the station for this plant opposite Blackwall, I found it covered with mud from the river, to the depth of at least three feet. I therefore fear that we shall see no more of this beautiful species in the station where it has maintained itself for so long a time.

Allium Scorodoprasum, L. I believe I saw this plant last July, about two miles below Gravesend, growing on the landward side of the ditch by the river-side. The ditch was too wide to leap across, and too muddy to wade through; so I was unable to get close to it; but I know no plant I could have mistaken for it, as I was within ten yards of it.

Anacharis Alsinastrum, Bab. The ditch by the Thames-side between Kew and Richmond is now full of this plant.

Echinochloa Crus-galli, Beauv. On the mud taken from the Thames, at Battersea, many plants of this species sprung up, but were buried before flowering, in the process of levelling the ground.

Setaria glauca, L. With the last, at Battersea. I found only a single plant; but Mr. Irvine observed it in considerable plenty.

Alopecurus fulvus, Sm. Epping Forest, near Wanstead; Putney Heath. Dr. J. A. Power finds it on Wandsworth Common.

Glyceria Borreri, E. B. S. Very plentiful on Plumstead practice-ground, with the Polypogons; Greenhithe to Gravesend.

Triticum laxum, Fr. Plentiful on the banks of the Thames and Medway. Resembles *T. repens* rather than *T. junceum*; but specimens from Ramsgate, collected by Mr. Moore, approach the latter.

Elymus geniculatus, Curt. I fear this plant must be erased from the British Flora. It certainly does not grow in the old station near Gravesend, where Mr. Irvine pointed out the locality to me where he had found it about thirty years ago.

Datura Stramonium, L. Near the windmill on Wimbledon Common.

Melittis parviflora, Lam. On the mud from the Thames at Battersea; on a new quay at Wandsworth, plentiful, but in company with *Plantago lagopus*, *Eruca sativa*, *Hibiscus Trionum*, and numerous other plants that have no title to be considered as even naturalized. Neither Mr. Irvine nor I could ascertain the source whence these had come.

J. T. SYME.

London, February 3, 1853.

Account of the Mosses and Lichens of the Malvern Hills.

By EDWIN LEES, Esq., F.L.S.*

THE Mosses, denominated by Linnæus "Servi," or humble handmaids in the economy of Nature, have exercised a considerable agency in the accumulation of the soil now upon the Malvern Hills; doubtless, indeed, they were the primary originators of vegetation upon the bare rocks, whose hollows they have filled up in the lapse of ages with a soft spongy carpet, and so encompassed and obscured them, that numerous masses of gray rock, almost immersed in the verdant mossy inundation, now scarcely exhibit their points above it. The lichens have been generally considered as the first pioneers of vegetation, but their efforts to create a *humus* for the nourishment of other plants are but trifling when compared with the economical powers of the mosses. To test this by experiment, I took a tuft of *Bryum capillare*, Linn., from the roof of an outhouse at Malvern Wells, which was abundantly studded with it, together with the black earth collected about its base. The mass altogether weighed six ounces, but when after repeated and careful washings I had extracted all, or nearly all, the black mould that enveloped the roots, the actual residuum of frondescence that remained when weighed amounted only to half an ounce; thus satisfactorily showing that the moss, through atmospherical and imbral agency, had formed a soil exceeding its own weight at the very least above ten times! I had reason to believe, too, that this had been accomplished within three, or four years at most. By operations on a more extensive scale, it is easily conceivable how a bare mass of rock may, in the course of a few years, be covered with a thick coating of soil sufficient for the nourishment of any of the phanerogamous species, adapted to the climate and elevation where they may stand. *Bryum hornum* has been noticed to be a great accumulator of soil in marshy spots; while the excessive growth alone of such mosses as *Sphagnum palustre*, *Dicranum glaucum*, *Bryum palustre*, *Hypnum molluscum*, *scorpioides*, *cuspidatum*, &c., in the course of time entirely fills up bogs, drinks up their water, and conduces to their ultimate establishment as component parts of *terra firma*, fit for useful cultivation. In this manner, then, have the originally bare crags of the Malvern Hills received that rich *humus* now covering their sides, and which, combined with the disintegrating

* From 'The Botany and Geology of Malvern, by Edwin Lees, F.L.S.'

touch of Time's mouldering fingers, renders their soil in the present day capable of immediate cultivation even in the steepest places.

On a first cursory glance at the turf of the hills, there seems a great sameness in the mosses that luxuriate there, *Dicranum scoparium* and *undulatum*, *Hypnum triquetrum*, *splendens*, *purum*, and *molluscum*, with the *Polytricha*, seeming as if they had united to exclude the rest, *Hypnum triquetrum* especially everywhere predominating. However, a little attention will show a considerable variety, especially upon or in the immediate vicinity of the rocks, or on the margin of the numerous tinkling rills that show a cincture of the tenderest green wherever they trickle down. The apple-fruited moss (*Bartramia*) has a most elegant aspect seated among the deep crannies of the rocks, and the *Anictangium* quite covers some spots with its gray tresses; while a hoary aspect is given to the loose slabs in the upper ravines, bearded, as they become in decrepitude, with the woolly *Trichostomum lanuginosum*. Some of the mosses, of course, are rare or local; a few being confined to the limestone on the western side of the range.

The Malvern Hills are particularly remarkable for the various Lichens they produce; so that the late accurate cryptogamic botanist, Mr. Purton, has remarked in his 'Midland Flora,' that even in Wales he had scarcely observed any lichens that did not grow upon the Malvern Hills. Indeed, he might have stated the converse, for lichens grow here that I have not met with in Wales. Most of them grow in a very luxuriant and beautiful manner, and in the moist autumnal and wintry months many of the rocks present an appearance with their lichens truly gratifying to the lover of nature. Several northern and southern species seem here to attain their respective limitations, for on the same craggy rocks of the North Hill at Great Malvern are found the beautiful golden-hued *Borreria flavicans* and the dingy northern *Parmelia stygia*. Some of the harder granitic rocks are entirely covered with *Umbilicaria pustulata*, which in the spring is of an olive-green colour, and as flabby as a piece of moist leather, though in the summer months it appears black and sooty, as if subjected to the action of fire. On other rocks the deep purple *Parmelia omphalodes* extends itself, contrasted with wide patches of the gray *P. physodes*, the darker *P. saxatilis*, the dusky *P. olivacea*, or the conspicuous pitted thalli of *Sticta scrobiculata*. On the higher rocks the curled *Cetraria glauca* grows in abundance; while a remarkably hoary aspect is imparted to the protruding masses by the silvery *Isidium coralloides*, and the still more elegant coralline appearance of

Sphærophoron compressum. The exposed masses of the ridge are many of them curiously dotted with the green adnate fronds of *Lecidea geographica*. The reindeer lichen (*Cladonia rangiferina*), called by Crabbe

“The *wiry moss* that whitens all the hill,”

is plentiful on the turf with its allied species, and the sadder and darker *Cornicularia*, as well as the curious dangling rock-hair (*Alectoria jubata*); while in every part the brown and scarlet apothecia of the *Scyphophori*, in all their multiform varieties, contribute to decorate the scene.

The calcareous rocks of the Silurian system at the base of the Herefordshire Beacon, especially on the side of Chance’s Pitch, exhibit some local species not observable on the syenitic rocks, as *Endocarpon Hedwigii*, *Urceolaria calcarea*, *Lecidea rupestris*, *Collema sinuatum*, &c. The crab’s-eye lichen (*Lecanora Parella*) is particularly fine and abundant throughout the chain from north to south, not only on the rocks, but on ash and other trees about the bases of the hills. I have been particularly attentive to the lichens, and have been as careful as possible to ensure correctness; though in such minute vegetation, often obscure even to a microscopic eye, it is very difficult to discriminate without some error. The *Opegraphæ* of the section *Graphis* are named on the authority of the Rev. W. A. Leighton. One lichen that I have met with appears to be undescribed, and I have thus characterised it:—*L. chryso-chlora* (golden-shielded *Lecanora*). Crust greenish, indeterminate, scattered, apothecia clustered sessile, very small, dull green, with a very thick, inflexed, gold-coloured or light ferruginous border. Scarcely visible to the naked eye but as a number of yellow specks on the exposed rocks; but under a lens very characteristic and peculiar.

The lichens form such a crust or time-tint of colour on the hoary rocks of Malvern, that it is impossible for the most superficial eye not to notice and admire them; and some, as the *Stereocaula*, appear like silver spangles scattered and clustered in the recesses of the rocks; though, when closely examined with a lens, these delicate, glaucous-green, granuliferous lichens appear like minute, branching shrubs, beautiful as a mineral efflorescence. Even on the turf the *Scyphophori*, with their brown and bright scarlet apothecia, under the name of *cup-mosses*, are so variable in aspect as to be generally admired and collected, and are often alluded to by the poets of nature, as in the following lines by Mrs. Hemans:—

"Oh, green is the turf where my brothers play,
 Through the long bright hours of the summer day;
 They find the *red cup-moss* where they climb,
 And they chase the bee o'er the scented thyme."

PROCEEDINGS OF SOCIETIES, &c.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, January 13, 1853.—Professor Balfour, President, in the chair.

The following donations were announced to the Society's library and herbarium :—From Dr. Royle,—his Papers on the Identification of the Mustard-tree of Scripture, and on the Hyssop of Scripture ; from Professor Treviranus, of Bonn,—his work '*De Compositione Fructus in Cactearum atque Cucurbitacearum ordinibus*;' Account of the Cultivation of the *Victoria regia* in the garden of the Hon. Edward Chitty, Kingston, Jamaica, from Dr. M'Nab ; British plants from Mr. Moore, of the Chelsea Botanic Garden, and Mr. Parker, Torquay. The Prospectus of Willkomm's work on the Flora of Spain, South-west of France, Corsica, and the Balearic Isles was laid on the table by Dr. Balfour.

Dr. Balfour noticed the following donations, recently made to the Museum of Economic Botany at the Botanic Garden :—From Henry Bains, Esq., Museum, York : Sections of a tree-fern twenty inches in circumference, and of *Urtica gigantea*, from New South Wales ; woody substance (supposed to be the work of an insect) taken from the centre of a log of purple-wood of Guiana ; fruit of the grapple-plant (*Uncaria procumbens*), from the Cape of Good Hope ; Polyporous from the willow, with brooches made from it, exhibiting a shining, velvety appearance ; opalized specimen of *Dacrydium Uredo*, from a tree of ten feet in circumference, said to be imbedded in basalt, in the Macquarie Plains, Van Dieman's Land ; also the following microscopical preparations :—Bract of *Poinsettia pulcherrima*, showing the arrangement of the cells, containing red colouring matter ; specimens of spiral fibres from spiral vessels, some of them composed of seven fibres, united so as to form a band, such as occurs in *Pleiotracheæ* ; section of the silicified wood of *Dacrydium Uredo*, showing the disk-bearing woody tubes. From Miss Neill, Gayfield Square : Specimens

of an opalized endogenous stem, carboniferous fern (*Neuropteris*), and an old oak quagh, from Orkney. From A. H. Balfour, Esq., Hong Kong, China: Specimens of Chinese manuscripts; the letters are written on narrow leaves (probably of a palm), which are fastened together so as to form small books. From Daniel Oliver, jun., Esq., Newcastle: Four specimens of the interpetiolar glands and hairs of *Pentas carnea*, put up in a solution of chloride of calcium, on slides for the microscope. From Alexander Duff, Esq.: Large specimen of *Conferva ægogropila*, from a lake in South Uist, Outer Hebrides. From Mr. James Scrymgeour, Dundee: Specimens of vegetable substance found in the interior of a coffin in the old burying-ground, Dundee.

Mr. Stewart M'Glashen exhibited his patent apparatus for transplanting trees, shrubs, and herbaceous plants. The method of operating was fully explained; and a specimen of *Araucaria imbricata*, 2½ feet high, with a ball of earth 21 inches square, and weighing in all 3½ cwt., was shown in the state in which it had been taken up from the Botanic Garden; also a specimen of *Helleborus niger*, in flower, taken up with a ball of earth, by a smaller apparatus, consisting of two semicircular spades, placed together so as to form a sort of iron flower-pot, by the handles being pressed outwards.

Dr. Balfour made some remarks on the efficiency of the apparatus, and the ease with which it was applied. The *Araucaria* shown had been taken up in six minutes from the time the spades were first applied to the soil. He had seen various kinds of trees and shrubs taken up; and in every instance the method was most successful. In some cases four and five tons of earth had been taken up in the Botanical and Experimental Gardens. Dr. Balfour considered the invention as an admirable one, and as being well fitted for its purpose.

Dyeing Properties of Lichens.

The first part of a paper 'On the Dyeing Properties of the Lichens,' by Dr. Lauder Lindsay, was read.

Dr. Lindsay stated that his attention had been directed to the subject of the natural history of the lichens, two years ago, by Professor Balfour; that he had since been engaged in occasional researches into the structure and properties of these plants; and that the chief object of his present paper was merely to show, from the present state of our knowledge on this subject, the great amount of observation, in various departments of lichenology, which still remains to be made, and to ask the assistance and co-operation of members of the Society

in particular, and the scientific world in general, in following out several special paths of research, and clearing up some obscure points specially demanding elucidation, which are indicated below. He mentioned that, as his experiments and researches were only in progress, he could not at present furnish a *complete* paper on the dyeing properties of the lichens, or on any other individual department of lichenology, but intended to lay before the Society merely a number of isolated facts and notes, bearing generally on the present state of this branch of botany and botanical chemistry.

The author, after a few prefatory remarks, continued:—"It was not long till I found that the field was comparatively a new and open one, and that, unaided, I could proceed but a very short way in the examination of a subject of such vast extent, at first chiefly from want of instruments *with* which to operate, but latterly from deficiency of materials *on* which to operate. In the summer of 1851 (besides studying, so far as our metropolitan libraries would allow, the literature of the subject), I commenced (with the intention of working out leisurely) a series of experimental inquiries on the following points of the natural history of the lichens.

"1. Their anatomy, organography, and physiology, and in particular:—

"*a.* Their *general* microscopical anatomy, with illustrative drawings and dissections. With the exception of the beautiful drawings contained in the 'Abbildungen' of Link, in the 'Cryptogamic Botany of Ross's Antarctic Voyage,' by Dr. Hooker, and in a few kindred works, we had then no complete series of drawings of minute structure, dissections illustrative of organography, nor any good monograph entering extensively, and, at the same time, accurately, into the special anatomy, &c., of these plants. But, since that period, the valuable memoirs of Tulasne, Bayrnoffer, and others have filled up a great gap in this branch of lichenology; and I believe we may shortly expect, from the author of the 'British Species of Angiocarpous Lichens,' a fuller work descriptive of the British lichens, which, I hope, will leave us little to do or wish for in this respect.

"*b.* The *special* anatomy of their *reproductive* organs, and the physiology of their reproductive function. On both of these subjects a war of discussion lately raged between the botanists of Germany and France; and its fury is only now beginning to be subdued. Tulasne is the first, so far as I am aware, who has published anything like a complete series of drawings and descriptions of the lichen reproduc-

tive organs and their contents, since the discovery of the lichen-phytozoa (the spermatia, or spermogoni, of various recent authors).

“For the purpose of informing myself on their general and special anatomy, I began a detailed microscopic examination of all the British genera, subsequently extending my investigations to species; but this being a labour of immense extent, in a path as yet comparatively untrodden, and requiring therefore a great amount of time and application, I have been unable to work far in this direction.

“*c. Their chemical composition*, as ascertained by analysis. A few of the lichens best known to us, on account of their uses in medicine and the arts, have, at different times, been analyzed by Berzelius, Proust, John, Nees, von Esenbeck, Schnedermann, Knop, Herberger, and other chemists; but their results have been very discrepant. It is therefore very desirable that the analyses made by these gentlemen should be carefully repeated at the present day, by men experienced in botany, as well as in chemistry; and it is further desirable that we should have an extensive and accurate series of analyses of all the British lichens (or, at least, of as many as can be obtained in quantity sufficient to subject to experiment) before we can come to any general and useful conclusion on the subject. I am not yet sufficiently acquainted with practical chemistry to undertake such analyses; but I have had, on different occasions, the ash of a few common species analysed qualitatively by more experienced friends. My efforts, however, in this direction have been greatly circumscribed by want of specimens. It can only be by the analysis of a large number of species that we can accumulate a mass of facts from which we may deduce general principles, and discover how far the chemical composition of different lichens is similar or varies; whether any, and what, relation subsists between their composition and external appearance, &c.

“*d. Their products and secretions*, including the chemistry of their nutritive and pigmentary principles, and its practical application. The subject of the colorific and colouring principles of the lichens has, within the last few years, attracted a due share of that attention which has been increasingly devoted to organic chemistry. Since 1830, Heeren, Kane, Schunck, Rochleder, Heldt, Knop, Stenhouse, Laurent, and Gerhardt have published valuable papers on these principles; but here, again, we have to regret the great discrepancy in the various results obtained; and there is therefore, here also, imperatively demanded re-investigation and correction before any of the results already published can be implicitly relied upon, and before we can have safe data

from which to generalize. I have no doubt that a great proportion of the obscurity overhanging this subject, depends on the circumstance that many of the chemists who have devoted attention to the colour-educts and products of the lichens were not themselves botanists, and have therefore probably, in some cases, at least, analyzed species under erroneous names, and also because their investigations have comprehended a much too limited number of species.

“ 2. Their *taxonomy*, or *classification*. This, however, is but a secondary, and comparatively unimportant, department, and can only be put upon a proper basis when the anatomy and physiology of the lichens have been fully investigated, and their laws firmly established.

“ 3. Their *geographical distribution*, a subject of no little interest in studying terrestrial nature on the large scale.

“ 4. Their utility.

“ *a.* In medicine. On examining the literature of this branch of lichenology, I found that the lichens were, at one time in the history of medicine, regarded as a panacea, every kind and degree of therapeutic action having been, by ‘ the profession,’ as well as the ‘ profanum vulgus,’ attributed to them. Being very sceptical on the matter, I was naturally anxious to test these therapeutic actions, by experimenting, with the old officinal ? species and their active principles, on man and the lower animals ; but such experiments I have been obliged, for the present, to delay.

“ *b.* In the arts, and especially in dyeing, including the collection of a series of the commercial dye-lichens, *i. e.*, those used by the manufacturers of London, &c., in the making of orchil, cudbear, litmus, and other lichen-dyes. While investigating the dyeing properties of the lichens, I made experiments, with a view to test their colorific power, on as many species as I could obtain in sufficient quantity to render it at all useful to operate on, that number, however, being very limited (between forty and fifty). But these experiments were speedily brought to a stand, on account of a paucity of material to work upon ; and one of my objects in placing the present remarks before the Society, is to request such members and their friends as have a superabundance of specimens of lichens, or are favourably situated for collecting them, and may be willing to sacrifice a few to such a purpose, to co-operate in furthering this branch of lichenology, by contributing a few of their spare duplicates. They need neither be rare nor fine specimens ; fragments, of every size and appearance, are equally acceptable ; indeed, I may emphatically say, in the usual words of the scrap-book title-page, ‘ *Scraps* thankfully received.’

The same subject (of the dyeing properties of the lichens) also led me to the Great Exhibition of 1851, where I found several small, but highly-interesting, collections of dye-lichens and lichen-dyes, fabrics dyed by the latter, &c., exhibited by various metropolitan and provincial orchil and cudbear manufacturers and dyers, and by private parties. To a number of these exhibitors I subsequently wrote, requesting practical information, and specimens; and while a few did not apparently consider it within the sphere of their trade (in other words, remunerative) to supply samples for scientific purposes, others of them, in the handsomest manner, placed specimens gratuitously at my disposal; and I therefore willingly embrace the present opportunity of returning my most sincere thanks for such favours, to Messrs. Benjamin Smith & Son, orchil manufacturers, London; Messrs. James Robinson & Co., orchil and cudbear manufacturers, Huddersfield; James Howe & Co., silk-dyers, Coventry; the Portugese Consul, London; &c.

“I would here take the liberty of shortly pointing out how you may lend material assistance, in the present state of experimental inquiry, on the various subjects just enumerated.

“1. By contributing lichens in quantity, for the purpose of maceration, with a view to test their colorific powers. Those growing on rocks, in alpine situations, or on the sea-coast, in warm climates, of a pale or white colour, and of a pulverulent or crustaceous consistence, are to be preferred; but it is not essential, though also important, that the specimens possess fructification, or be otherwise in good condition.

“2. By contributing specimens, in *good* condition (and particularly with fructification), of native or foreign lichens, common or rare, with their names (botanical and vulgar), and notes of their habits, and any similar information, to illustrate structure, organography, geographical distribution, &c.

“3. By furnishing information on their economic uses, and on their special applications in dyeing and other arts (particularly on their employment as dye-agents, by the natives of Britain and other countries), with specimens of the lichens so used, and their common names, specimens of fabrics dyed therewith, notes of the processes employed for the elimination of the dyes, &c. Parties resident in or travelling through our western highlands and islands, the northern highlands, Ireland, Wales, Norway, Iceland, and similar countries, are most likely to be able to afford this description of information, many native

lichens being still used, by the peasantry of these countries, to dye their home-spun yarn, &c. ; and, lastly,

“ 4. By contributing to the literature of lichenology, in the form of references to books or journals, &c., containing information of any kind on the natural history of the lichens ; as well as to orchil and cudbear manufacturers, dyers, and other parties engaged in the importation or sale of orchella-weeds and other dye-lichens, or their conversion into dye-agents.”

Dr. Lindsay illustrated his paper with drawings of the minute anatomy of lichens, preparations of the dyes extracted from various native species, and specimens of the plants yielding these colours.

Flora of the District in the Neighbourhood of Peebles.

A paper by James Young, Esq., intituled ‘ Remarks on the Flora of the District in the Neighbourhood of Peebles,’ was read.

The author gave a brief account of some botanical walks made in the autumn of 1851, and enumerated some of the plants which he had collected, and the localities in which they were found.

Mr. G. S. Blackie remarked that Mr. Young had not visited some of the best districts in Peebleshire ; otherwise he would have found such plants as *Betula nana*, *Saxifraga aizoides*, *S. stellaris*, and *S. oppositifolia*, *Sibbaldia procumbens*, *Allosorus crispus*, &c., none of which appeared in Mr. Young’s list.

Cultivation of Victoria regia in Jamaica.

A paper ‘ On the Cultivation of *Victoria regia* in Jamaica,’ by Dr. G. M’Nab, was read.

In this communication Dr. M’Nab stated that seeds had been sent to him by his brother, Mr. James M’Nab, of the Botanic Garden, Edinburgh, in September, 1851, that they had been planted by the Hon. Edward Chitty, at Kingston, in a tank prepared for the purpose, and that the plant had grown vigorously, and had flowered well. The full details in regard to the growth of the plant were given in a Jamaica paper, copies of which have been already noticed in this report, as presented to the Society.

Dr. Balfour observed that the structure of the stem of the *Victoria regia* had been examined recently by Mr. Henfrey, in the case of a specimen which flowered in the garden of the Royal Botanic Society, London. He says that the plant developes its stem by a terminal bud, like palms, throwing out leaf after leaf, in a spiral course ; that there is no tap-root in the perfect plant, that produced in the embryo

decaying, and its place being supplied, as in Monocotyledons, by adventitious roots. There is no true bark, no pith, and no annular zones of vessels, the vascular bundles being scattered as in Endogens. Mr. Henfrey regards the stem of *Victoria* as endogenous, as Trecul had already done in regard to other Nymphæaceæ, especially *Nuphar lutea*. The chief differences, Mr. Henfrey says, from Endogens are the absence of fibrous layers between the cortical and central tissues, and the composition of the vascular bundles being exclusively of spiral vessels, with unrollable fibres.

Edward Ravenscroft, Esq., Highland Society's Museum, was elected a Fellow.

Mr. Frederick Yorke Brocas, County Hospital, Winchester, was elected an Associate.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-second Sitting.—Saturday, February 26, 1853.—MR. NEWMAN, President, in the chair.

Nativity of the Box-tree.

The President read the following note, from Mr. C. C. Babington, dated St. John's College, Cambridge, January 28, 1853:—

“Mr. Watson, in his *Cybele* (ii. 366), appears very much inclined to consider the box-tree as not originally a native of England. The following extract from the beginning of Asser's ‘*Life of King Alfred*,’ appears to show that it was plentiful in Berkshire 1000 years since. His words are:—‘*Berrocscire ; quæ paga taliter vocatur a “berroc” sylva, ubi buxus abundantissime nascitur.*’”

Chrysocoma Linosyris at Weston-super-Mare.

The President read the following note, from Mr. T. B. Flower, dated Seend, near Melksham, February, 1853:—

“Visiting Weston and its neighbourhood for a few days, during September last, I was fortunate enough to find a single plant of *Chrysocoma Linosyris*, on the hill near Knightstone. It required a good deal of searching for, being very diminutive, and not nearly so luxuriant as I have seen it growing at Berry Head. Having specimens, from the neighbourhood of Whorle Hill, in my herbarium, gathered by the late Mr. William Christie, I left the plant growing, in the hope of its gradually spreading. In the *Cybele* it is recorded

that Dr. Hooker searched for it, without success, in 1846 ; but in the following year, I am informed, it was observed by Mr. Tanner, near Anchor Head, and again in 1849, by the Rev. W. Crotch and Mr. Robert Wright, near Knightstone, possibly in the same locality as observed by myself. It is therefore more than probable that the plant may still be found in other parts of the neighbourhood, and should be searched for by some careful observer. I will just add that the *Eryngium campestre*, which I used to observe rather abundant at Weston, is becoming quite a scarce plant, and will, I am fearful, soon become lost, having only noticed one or two plants during my visit."

Plants found in North Wales.

The President read the following note, from Mr. W. Mathews, jun., dated Edgbaston House, Birmingham, February 14, 1853 :—

"During a short tour through North Wales, in August, last year, I gathered one or two plants a notice of which may be interesting to the readers of the 'Phytologist.' I am indebted to my friend Mr. Babington for the determination of the hawkweeds.

"*Hieracium strictum*, Fries. This plant occurs sparingly on Cader Idris, on the precipitous part of the mountain above Llyn Cae, to the south-east. (New to Wales).

"Another hawkweed, most probably *Hieracium crocatum*, Fries, occurs, in considerable abundance, on the left bank of the road from Llangollen to Corwen, about four miles from the former place.

"*Ulex Gallii*, Planch. Very common in North Wales. I noticed it in the counties of Denbigh, Merioneth, and Carnarvon.

"*Rubus incurvatus*, Bab. Common in Merionethshire.

"*Rubus suberectus*, Aud. Wood at Pystill y Cayne, near Dolgelly, Merionethshire.

"A bramble also grows at this latter place, which I believe to be *Rubus Sprengelii*, Weihe. I have noticed these last four plants, as I find, on reference to the third volume of Watson's Cybele, that information upon them is wanted from the counties mentioned above."

Effects of the late Mild Weather.

The President read the following note, from Mr. A. G. More, dated Trinity College, Cambridge, February 4, 1853 :—

"If the following plants, observed flowering in the Isle of Wight, be added to the list already published in the 'Phytologist,' they will, I think, indicate still more clearly the remarkable advance of the

present season, since they are all genuine spring flowers. In December we found a solitary flower of *Viola sylvatica*. Jan. 10, *Tussilago Farfara*, in flower. Jan. 21, *Mercurialis perennis*, and by the end of the month plenty in flower; *Caltha palustris*, several in flower, and many in bud, with quite an April luxuriance; *Narcissus Pseudo-narcissus*, twenty or thirty in flower. Jan. 31, *Cerastium tetrandrum*, in flower; *Alchemilla arvensis* (young plants), in flower; and on the same day (Jan. 31) we were no less pleased than surprised to find our little friend of last March, *Draba verna*, mostly with only a flower or two, scarcely raised above the leaves, but in a few cases even *in seed*, on its usual stem."

The following remarks, by Mr. I. W. N. Keys, dated Plymouth, January 25, 1853, and referring to the same subject, were read:—

"At this season of the year little can be said in the way of adorning a botanical ramble. I will therefore 'a plain unvarnished tale deliver,' and say that yesterday, being a fine day, I strolled, with another of Flora's votaries, to Weston Mills, which are situated about two miles from Plymouth, believing that, from the extreme mildness of the winter, *Helleborus viridis*, which grows in an old orchard at the first-named place, would be in flower. And such was the case: we gathered several examples. Besides this, in the same piece of ground, snowdrops (*Galanthus nivalis*), in large number, were drooping their graceful heads in beauty around us. What a charming flower is this! and how much is its loveliness enhanced by its early appearance, ere yet the winter has departed! The *Narcissus Pseudo-narcissus*, neighbour to the snowdrop, had not yet progressed beyond the bud condition; but it will very soon burst from its 'pent-house.' A solitary primrose (*Primula vulgaris*) gleamed here and there. The pilewort (*Ranunculus Ficaria*) was also unfolding its enamelled golden petals; and *Mercurialis perennis* was in bloom. All the foregoing were found within the precincts of the orchard. Dandelions, daisies, groundsel, and that little grass, *Poa annua*, were seen frequently during our walk, all in flower, of course; otherwise, they would not be named. The leaves of *Cotyledon Umbilicus* were extremely abundant, and very large; a circumstance attributable, I presume, to the very wet season which we have had. *Vinca minor* (lesser periwinkle) was trailing beautifully over a road-side hedge near Ham, and bedecking it with its delicate purple flowers. In this situation the plant appears perfectly wild. Here and there, in low and sheltered spots, a *Geranium Robertianum* had outlived the 'pelting of the pitiless storm,'

and bloomed on from autumn until now, as, also, had the *Pyrethrum Parthenium*. We also observed *Rumex obtusifolius* in flower."

The annexed notes on the mildness of the weather in the years 1747—1767, furnished by Mr. Luxford, were also read :—

"The following weather-notes will, I think, form appropriate *addenda* to the papers on the mildness of the present season by Dr. Bell-Salter and Mr. Lloyd in the last number of this journal (*Phytol.* iv. 845). They occur in the series of letters from Peter Collinson to Linnæus, printed in the Linnæan Correspondence,* and are interesting, inasmuch as they show that in the matter of mild winters and earthquakes there is really 'nothing new under the sun,' whatever may be said of railroads, steam-vessels, and the electric telegraph.

"English gardens, says the editor of the Correspondence, are indebted to Mr. Collinson 'for the introduction of many new and curious species, which he acquired by means of an extensive correspondence, particularly from North America.' His name is perpetuated in *Collinsonia Canadensis*, a North-American plant, imported in 1735, and so named by Linnæus in honour of his truly-amiable friend, who died at Mill Hill, near Hendon, Middlesex, on the 11th of August, 1768, in the seventy-fifth year of his age, and 'in the full possession of all his faculties, and of all his enthusiasm for the beauties of Nature, attended by far more important consolations and supports,' as is well expressed in his last letter to Linnæus, dated March 16, 1767.

"London, Jan. 18, O. S. 1743-4.—We have now a wonderful fine season, that makes our spring flowers come forth. I am sure you would be delighted to see my windows filled with six pots of flowers, which the gardener has sent me to town; viz. great plenty of Aconites, white and green Hellebore, double Hepatica, Crocus, Polyanthus, Periwinkle, Laurustinus, vernal red Cyclamen, single Anemonies, and Snowdrops. This is my delight to see flowers, which make a room look cheerful and pleasant, as well as sweet. None of these were brought forward by any art, but entirely owing to the temperature of the season, though some years I have known things forwarder than now.'

"London, Oct. 26, 1747.—My garden is in great beauty, for we have had no frosts; a long, dry, warm summer and autumn, grapes very ripe. The vineyards turn to good profit, much wine being made

* 'A Selection of the Correspondence of Linnæus and other Naturalists, from the Original Manuscripts. By Sir J. E. Smith, Pres. L.S., &c. 1821.'

this year in England. Sir Hans Sloane is hearty, Miller is well, and so adieu.'

"'London, Oct. 3, 1748, O. S.—We have had a fine Summer. Great plenty of all sorts of fruits and grain, and a very delightful Autumn. It is now as warm as Summer; no bearing of fires. My orange-trees are yet abroad. My vineyard grapes are very ripe. A considerable quantity of wine will be made this year in England.'

"'May 8, 1749.—On Thursday the 8th of February, at about half past 12 at noon, we had a smart shock of an earthquake, so violent that many ran out of their houses, thinking them falling down. How the Winter has been in Sweden I do not know, but at London the like warmth and mildness were never remembered. Our Autumn was long, warm, and dry, with a few slight frosts before Christmas; but we have had since fine warm dry weather, and no frosts or snow. Our gardens were in great beauty in January and February; almonds, apricots, and peaches in blossom.

"'Feb. 23d, I went into the country. The elm hedges had small leaves. Standard plums, almonds, and Cornus in full blossom. Gooseberries shewing their fruit. In short it would be endless to tell you the wonders of this season.

"'March 5, the fig in my London garden had small leaves, when peas and beans under South walls were in blossom.'

"'Ridgeway House, Dec. 25, 1757.—The extraordinary heat of our summer has ripened all sorts of fruits to perfection. In two gardens I saw this year pomegranates against south walls, without any art, ripened beyond what can be imagined in so northern a climate. They look extremely beautiful, and are of the size of some brought from abroad.

"'Our autumn has been long dry and warm, and so continues, for a few slight frosts have not stripped the garden of flowers at Christmas-day. We have four sorts of Aster and Virga aurea in flower, and plenty of Leucojums, double and single, Chrysanthemums, &c.

"'The winter scene is not closed before spring flowers begin; for there are plenty of Polyanthus-narcissus, Pansies, and sweet Violets, Primula veris, Polyanthus, Aconite, Hepatica, Anemonies both double and single, and Laurustinus. You would have been delighted and surprized to see the large nosegay that was all flowers gathered out of the open garden, without any art, Dec. 27, 1757.'

"'July 25, 1759.—We had the mildest winter ever known. Our spring was early and very agreeable, and our summer the finest and warmest since 1750. Great plenty of all sorts of grain and fruits. New wheat of this year's produce has been the 21st instant at market.'

“ ‘London, Sept. 2, 1762.—We have had a delightful warm summer ; all the fruits of the earth very good, and in great plenty ; and what crowns all, the blessing of peace is like to be added.’

“ ‘London, Sept. 15, 1763.—Almost every day rain since the middle of July, the spring and summer very dry to that time. Very great plenty of grass and all sorts of corn, but the weather unkindly for the harvest.’

“ ‘London, Sept. 17th, 1765.—You, my dear friend, surprize me, with telling me of your cool and wet summer ; whereas our summer has been as much in the extreme the other way. For all May, June, and July, were excessively hot and dry ; but six or seven rainy days in three months, so that all our grass fields look like the sun-burnt countries of Spain and Africa. Our Fahrenheit’s Thermometer frequently 84 and 85 in the shade in the open air, but in my parlour frequently at 95. I do assure you I have had little pleasure of my life this summer, for I cannot bear heat. I have longed to be on Lapland mountains. The beginning of August we had some fine rains, but they did not recover our usual verdure. Since, to this present writing, hot and dry weather, not a drop of rain for fourteen days past. Our hay is very short, and oats and barley but a middling crop ; but of wheat, which we most wanted, good Providence has favoured us with a plentiful crop, and a good harvest, which began two weeks sooner than in common years. Peaches, Nectarines, Figs, Grapes, Pears, &c. are early ripened, and are richly flavoured, and many exotic shrubs and plants flower finely this year. My garden is now a paradise of delight, with the variety of flowers and plenty of roses now in bloom, as if in May or June. But to obtain all this pleasure, great pains have been taken to keep the garden continually watered every evening.’

“ ‘London, Sept. 25th, 1766.—We have had a most uncommon rainy summer, which was no way propitious to the growth of the wheat ; but it pleased Good Providence to send us the finest hot and dry harvest ever known, yet the warm constant rains drew up the wheat so much to stalk, that the ears are very light. I hope there will be sufficient to support the nation, now we have prudently stopped the exportation ; for so great are the wants, and the demand for foreign markets was so great and so pressing, that it advanced the price so considerably as to occasion insurrections in many parts of the kingdom, to stop by force the corn from being exported ; but now a proclamation is come out to prevent it, I hope all will be quiet again. Much wet has made great crops of grass ; so that every where we have had second crops of hay almost as large as the first, and a glorious

autumn to make it. The fields have a most delightful verdure, and the gardens are in the highest beauty, being covered with great variety of autumn flowers, having not had the least frost to Oct. 4. I have housed none of my succulent exotics; for the weather is so hot, dry, and fine, they are better abroad than in the house. I survey my garden with raptures, to see the infinite variety with which the great Creator has enriched the vegetable world.'

"'Ridgeway-house, on Mill-hill, ten miles North of London, March 16, 1767.—I am here retired to a delightful little villa, to contemplate and admire, with my dear Linnæus, the unalterable laws of vegetation. How ravishing to see the swelling buds disclose the tender leaves! By the public news-papers we were told that with you in Sweden the Winter was very severe, the Sound being frozen over. I have no conception of the power of that cold which could fetter the rolling ocean in icy chains. The cold was what we call severe, but not so sharp as in the year 1740. It lasted about a month, to the 21st of January, and then the thaw began and continued. February the 1st and 2d were soft, warm, sunny days, as in April, and so continued, mild and warm, with southerly winds, all the month. This brought on the Spring flowers. Feb. 8th, the *Helleborus niger* made a fine show; the *Galanthus* and Winter Aconite by the 15th covered the garden with beauty, among some *Crocuses* and *Violets*, and *Primula veris*, &c. How delightful to see the order of Nature! oh, how obedient the vegetable tribes are to their great Lawgiver! He has given this race of flowers a constitution and fibres to resist the cold. They bloom in frost and snow, like the good men of Sweden. These flowers have some time made their exit; and now, March 7th, a tenderer tribe succeeds. Such, my dear friend, is the order of Nature. Now the garden is covered with more than 20 different species of *Crocuses*, produced from sowing seeds, and the *Iris Persica*, *Cyclamen vernale*, and *Polyanthos*. The 16th March, plenty of *Hyacinthus cæruleus* and *albus* in the open borders, with *Anemonies*; and now *my favourites* the great tribe of *Narcissuses*, shew all over the garden and fields; we have two species wild in the woods that now begin to flower. Next the *Tulipa precox* is near flowering; and so Flora decks the garden with endless variety, ever charming.'

"The editor of the 'Correspondence,' Sir J. E. Smith, adds the following remarks, written by a friend to whom he had submitted the letters of Mr. Collinson:—

"'I have edified much on the subject of the Springs, which appear at that time to have been much milder than at present. We have now, for many years, had hard Winters occasionally, and an almost

constant succession of ungenial Springs. The seasons are, I conclude, subject to these variations. The series of mild Springs, which ended about the year 1785 or 1786, seems to have begun at least as early as 1749, and to have lasted 36 years. Our present series of cold Springs has yet lasted only 23 years. Of course we have 13 bad years to come before we can expect Violets and Narcissuses in January, and Grapes ripe in the beginning of September.' ”

Plants found at Barmouth, Devon.

The President read the following, by the Rev. D. Broughton :—

“ I send a list of some of the plants I gathered at Barmouth, last summer. There are several not mentioned in Watson's ‘ Botanist's Guide.’ Anthyllis Vulneraria, Allium vineale, Matthiola sinuata (formerly abundant ; I could find only three weak plants, not in flower), Campanula hederacea, Dianthus deltoides (abundant on the slope towards Aber Rhanffroch), Sedum reflexum, S. rupestre, S. Forsterianum, Anthemis arvensis, A. nobilis (Cwm Bychan), Lamium amplexicaule, Mercurialis annua, Trifolium fragiferum, Scilla verna (fide Rev. Wm. Jelf), Viola lutea, Hypericum Androsæmum, Erodium maritimum, Lavatera arborea, Suedia maritima, Serratula tinctoria, Sedum Telephium, Crithmum maritimum (sparingly below Aber Rhanffroch), Spiranthes autumnalis, Gentiana Amarella, Vicia Orobus (in a hedge about a mile beyond Llanelyd, on the road to Trawrfynnydd), Calystegia Soldanella (in the greatest abundance and beauty, especially at Mochras Island), Habenaria chlorantha, H. bifolia, H. viridis, Gymnadenia conopsea (this plant assumes such a different habit, when growing in a bog, from that which it has when growing on dry banks, as, for instance, the chalky south downs near Folkstone, as to suggest the doubt whether they are the same species), Lathyrus sylvestris, Pinguicula vulgaris (growing nearly down to the water's edge), Trollius Europæus, Saxifraga tridactylites, S. stellaris, S. hypnoides, Carex dioica (*cum multis aliis quæ nunc, &c.*), Diplo-taxis tenuifolia (Harlech Castle), Euonymus Europæus, Mentha rotundifolia (near Hendre Coed), Isoetes lacustris, Silene Anglica, Veronica hybrida (in tolerable abundance on the little rocky knoll just out of Barmouth, on the Harlech road), Narthecium ossifragum, Antirrhinum Orontium, Cakile maritima, Echium vulgare, Geranium sanguineum, Antennaria margaritacea (in one suspicious locality just below the turnpike on the Harlech road), Polypodium Phegopteris, Aspidium Oreopteris, Osmunda regalis, and Botrychium Lunaria.”

Sketch of the Island and Flora of Hongkong, China.

By Dr. H. F. HANCE.*

HONGKONG, a corruption of Hiangkiang, “the Fragrant Streams,” is the name of one of a number of islands in the China Sea, at a short distance from the mouth of the “River of Pearls,” on the left bank of which stands the city of Canton, and from which it is divided by a narrow strait, called Kap-shui-mún† (*vulgo* Cap-sing-moon), or “Swift-water Passage,” running between the mainland and a continuous chain of small islands, of similar character and aspect to itself. It is situated between lat. $22^{\circ} 9'$ and $22^{\circ} 21'$ North, and long. $114^{\circ} 6'$ and $114^{\circ} 18'$ East, and is distant from Canton about eighty-five miles, and forty from the Portuguese settlement of Macao, on the peninsula of Hiangshan. At the narrowest part of the Lai-i-mún passage to the eastward, it is only about half a nautical mile from the mainland. It resembles, in general form, a scalene triangle, of which the apex is towards the West, but is of very irregular and sinuous outline, especially on the southern coast, which forms the longest side of the triangle, having an area of 29.14 square miles; while it is not quite twenty-seven miles in circumference.

It consists of a long and precipitous mountain-ridge, running east and west, in some places gradually sloping down towards the sea, where it is met by extensive level beaches of fine, clear, white quartz-sand; in others, terminating abruptly in frowning perpendicular cliffs, more than 100 feet in height, perforated at their base by caverns, into which the waves dash with a hollow sound, throwing up clouds of spray. From this ridge, spurs diverge at different angles. The peaks vary in altitude, the loftiest being about 1860 feet above the sea-level. The prevailing rock is syenite (extensively quarried, and used for edifices), which is found in immense blocks, imbedded in a soil composed of the same rock, in various stages of disintegration and decomposition (laterite), or piled up in fantastic shapes on the hill-summits. The constituents of this rock also occur more or less separate;—felspar in its normal condition, or changed into a pure white or pinkish clay; hornblende cropping out on the surface, in

* Read before the Linnean Society, and communicated by Berthold Seemann, Esq., F.L.S.

† By a very natural error, I find, in nearly all systematic works, plants gathered about this locality noticed thus:—“Hab. in cap. syng-moon,” or “crescit ad prom. sing-moon;” the first word being understood as an abbreviation of *caput*.

deep black lustrous crystals ; and quartz traversing the laterite, in dykes of variable thickness. Masses of trap are also met with, translucent crystals of carbonate of lime not unfrequently found in the centre of the blocks of syenite, and the beds of ravines afford fragments of laminated mica. No signs of stratification, or of volcanic action, are discoverable. At the base of the primary ridge, in those places where it terminates at some distance from water-mark, and between the various spurs, patches of alluvial soil are found, consisting exclusively of decomposed vegetable matter washed down by the rains, and mingled with the laterite. These are sedulously turned to account by the natives, for agricultural purposes, and, owing to care in manuring and irrigation, are sufficiently productive. The numerous ravines by which the flanks of the hills are cleft, furnish a never-failing supply of water, remarkable for its extreme purity ; and a little below one of the loftiest peaks arises a considerable spring, the singular position of which leads to the belief that it may have a submarine communication with the mainland. During the summer season, these streams become greatly swollen ; and the spectator sees the angles of junction of the spurs and main range distinctly traced out by lines of foam, indicating the course of these turbulent cascades.

The climate is subject to a variation of temperature, from 47° to 93° Fah. The daily range rarely exceeds fifteen degrees. Once only, during the years 1844—1851, did the thermometer sink as low as freezing point. Towards the end of October or the commencement of November, the north-east monsoon sets in. The atmosphere is wonderfully serene ; the air cold, bracing, and dry ; and the transition from an atmosphere saturated with moisture, is marked by the warping and splitting of tables and other wooden articles of furniture, accompanied by considerable noise, and the curling up of papers, as occurs in this climate when they are placed in a heated room. This is the winter, which endures until about the middle of February, during which scarcely any rain falls, and vegetation is dried up and scanty, a few *Compositæ* being nearly all that can be found flowering. Gradually the temperature becomes higher, the atmospheric deposits greater, the dry, discoloured leaves of the myrtle, *Melastoma*, and *Emblica* fall, their branches kindle with a tender vernal green, and innumerable flowers spring up from the turf, until, about May, summer is heralded by the advent of the south-west monsoon. This season is characterized by a most intense and oppressive heat, which causes the greatest languor to European residents ; rain falls for a week or ten days together, rather in sheets than drops ; the swollen torrents rush

roaring down into the sea, which they often discolour for a quarter of a mile from the shore ; terrific thunderstorms reverberate amongst the hills, which are hidden in a dense veil of cloud and mist ; and such is the excessive humidity of the atmosphere, that articles of wood or Russia leather, or the covers of books, even if washed over with alcohol or a solution of some essential oil, become, in the course of a night, covered with a thick, blue mould. The rain will then cease for a few days ; the heavens remain unclouded, though always more or less hazy, and lit up in the evenings by almost unintermitting flashes of sheet lightning ; not a breath will agitate the air, tremulous with the heat radiated from the ground ; and the silence is alone broken by the unceasing, loud, and monotonous chirping of the *Cicadæ* hidden in the grass. At this period, vegetation is at its height, and is developed with wonderful rapidity : a few days suffice to perfect the blossoming of the richest flowers, which, again, fade as quickly ; so that to an occasional explorer the face of Nature is singularly protean, and impresses him with a high idea of its luxuriance. About the beginning of September, the rain becomes much less frequent, though the heat is still excessive, and, as a natural consequence, the Flora assumes a more sober and less attractive habit. This period may be considered equivalent to our autumn. It is now that the island is occasionally visited by typhoons, those terrible circular storms which traverse the Indian Ocean and China Sea, and, when they meet with the land in their course, unroof houses, tear off and carry away doors and Venetians, drive vessels from their anchorages, prostrate trees, blight and destroy nearly all vegetation, and cause wreck and devastation wherever they pass. Finally, the temperature decreases, the rains cease, and the vegetable world remains dormant, seeking repose after its late activity, and recruiting strength for that of the succeeding year : winter has again returned, and the cycle of the seasons is completed.

To a stranger landing, or regarding the island from the sea, the aspect of Hongkong is very unpromising, conveying the idea of almost absolute sterility. The hills are covered by a mantle of coarse grass, amidst which rise masses of bare, blackened rock ; while the monotonous scene seems varied only by a few bushes or a solitary tree studded here and there, and by scattered groves of the *Pinus sinensis* clothing some of the declivities. As remarked by Meyen, there is no doubt that this tree was at one time far more common, and originally formed dense woods on the flanks of the hills of all the islands hereabouts ; but it is used very extensively by the Chinese

for burning; and, plantations being seldom or never formed, it thus decreases rapidly. On a closer inspection, however, the botanist is gratified by finding that the first impression is very deceptive; and, indeed, it is probable, that whether as regards the number of species, or the variety of new and interesting forms comprised in its Flora, the island is, for its size and geographical position, entitled to a very high rank.

The *littoral** Flora consists of *Vitex trifolia*, the fruit of which resembles allspice in taste, *Clerodendron inerme*, *Scævola taccada*, *Chenopodinæ*? sp., *Ipomœa pes-capræ*, trailing to an immense distance along the sands, and rooting at intervals, *Dilivaria ilicifolia*, two or three species of *Euphorbia*, *Guilandina bonduccella*, forming, in some places, impenetrable thickets, *Wollastonia scabriuscula*, *Platycodon grandiflorum*, always amongst rocks close by the sea, *Crotalaria calycina* and *C. albida*, *Ægiceras majus*, *Ardisia crispa*, *Paritium tiliaceum*, which affords a magnificent spectacle when covered with its fine sulphur-coloured flowers, which are much infested by a

* It may not be uninteresting to compare with this list the littoral Flora of other islands at no great distance. That of Malacca, according to the late Mr. Griffith, consists of *Calophyllum*, *Sideroxylon*, *Scævola*, *Pterocarpus*?, *Terminalia catappa*, *Verbesina*, *Premna*, *Ficus*, *Vaccinium*, *Sapindeæ*, *Hoya*, *Cassyta*, *Grammatophyllum*, *Loranthus retusus*, *Vitex*, *Xylocarpus*, *Crotalaria longipes*, *Calamus*, *Myrica*, *Eugenia*, *Epithinia*, *Plectranthus*, a *Pomacea*, *Maba*, *Gmelina*, *Avicennia*, *Rhizophora*, *Hydrophytum*, *Pogonatherum*, *Filices*, *Algæ*, &c. That of Prata Island (Prata, in Portugese, *silver*; several vessels freighted with treasure having been lost there), a low coral islet, situated in N. lat. $20^{\circ} 42' 55''$, and E. long. $116^{\circ} 44' 45''$, and bearing S.E. by E. 175 miles from Hongkong, according to a collection that was brought to me of all that is found thereon, comprises *Ipomœa pes-capræ*, *Tournefortia argentea*, *Euphorbia*, *Morus alba*, no doubt of accidental occurrence, *Cassyta*, *Morinda bracteata*, *Scævola taccada*, a very beautiful and distinct species of *Portulaca*, with yellow flowers (*P. psammotropha*, *mihi*, in Walp. Ann. Bot. Syst. ii. ined.), and an apparently new genus, closely allied to *Pyxipoma* (*Psamathe marina*, *mihi*, l. c.). The "Noord Wachter" (a very small, uninhabited island, probably in no part twenty feet above the level of the sea, and with a soil composed exclusively of broken-up white coral, and a slight admixture of decayed vegetable matter, situated between Java and Sumatra, in lat. $5^{\circ} 12' 30''$ S., and long. $106^{\circ} 32'$ E., and bearing from Batavia N. by W. $\frac{3}{4}$ W. 60 miles, which the writer had an opportunity of visiting, owing to the vessel in which he returned from China striking on a reef, and remaining fixed there), is thickly clothed with lofty arborescent figs, *Rhizophora*, *Pemphis acidula*, a large-leaved, tall *Euphorbiacea*, *Morinda*, a lilac-flowered leguminous plant (apparently a *Canavalia*), a *Cinchonacea*, *Scævola taccada*, *Piper betel*, *Calamus*, and some others, which he was, from want of books, and on account of the circumstances of his stay, unable to determine. There were no palms; but all the plants observed were unquestionably wild.

large black ant, *Abrus precatorius*, *Cassia pumila*, *Glossogyne pinna-tifida*, *Pandanus foetidus* (much used as a hedge by the natives, who also eat the tender shoots, by which means, and by constant clipping, it remains stemless, though, when left to itself, it assumes an arborescent form), the lovely and fragrant *Crinum asiaticum*, *Tetranthera Roxburghii*, a fine, tall tree, *Spinifex squarrosus*, a *Rottbœllia*, and *Heteropogon contortus*.

Amongst those plants which occupy a subordinate position in the Flora, but are still more or less common or characteristic, must be enumerated a pretty little *Curculigo*, with leaves like a *Luzula*, which expands its star-like, golden-coloured blossoms close to the earth on the advent of spring, *Rourea microphylla*, *Ternstrœmia japonica*, *Ficus pyriformis*, *F. stipulata*, and *F. hirta*, *Crotalaria elliptica*, with its hispid, orbicular legumes, the fine crimson-flowered *Ixora blanda*, an undescribed *Begonia*, *Raphiolepis rubra*, which replaces our hawthorn, *Æginetia indica*, *Bambusæ*, the elegant *Blackwellia Loureirii*, *Massænda pubescens*, conspicuous for its large, irregular, snow-white calyx-segment, *Paliurus Aubletii*, *Berchemia lineata*, *Strychnos colubrina*, the seeds of which are employed by the Chinese, under the name of *Mâ tau*, or horse-beans, for the destruction of rats, &c., *Choripetalum obovatum*, *Striga hirsuta*, the tallow-tree (*Stillingia sebifera*), *Jasminum paniculatum*, fragrant and free-flowering, the purple-bloomed *Pterostigma grandiflorum*, *Pothos scandens*, *Paratro-pia cantoniensis*, a handsome, shady tree, *Syllisium buxifolium*, a very neat shrub, *Embelia ribes*, *Osbeckia chinensis*, *Ardisia primulifolia*, adorned with glossy, crimson, holly-like berries, *Rostellularia procumbens*, &c. *Cardiospermum halicacabum*, with its bladderly fruit, scrambles amongst the herbage, amidst which rise the pretty lilac spikes of *Ophiopogon spicatus*. Several *Gardenias*, *Ilices*, *Pittosporum glabratum*, and *Eyrea vernalis* please the eye by the neatness of their foliage, round which *Cuscuta monogyna*, *Toxocarpus Wightianus*, and several *Bauhinias* twine their slender stems. To these must be added a velvet-leaved, arborescent *Sponia*, the delicate *Salomonias cantoniensis*, *Oxalis corniculata*, *Rubus parvifolius*, *R. leucanthus*, *nob.*, and *R. reflexus*, the latter remarkable for the extreme beauty of its foliage, two handsome *Cæsalpinia*æ, *Zornia diphylla*, which enamels the turf with its minute yellow blooms, resembling those of our *Lathyrus pratensis*, *Asparagus falcatus* (to which must be referred, as a synonyme, the *Melanthium cochinchinense* of Loureiro, placed by Kunth among altogether doubtful plants), several species of *Hedera*

and *Cissus*, and, amongst ferns, *Osmunda Vachellii* and *Blechnum orientale*.

Streamlets and their banks, moist rocks and inundated localities are rendered gay by the delicate *Drosera Loureirii*, *Xyris indica*, an elegant Primulaceous plant, white, yellow, and blue-flowered *Utriculariæ*, the tall *Philydrum lanuginosum*, *Ludwigia*, *Jussiaëæ*, with their white or yellow blossoms, *Hypericum monogynum*, *Eriocaulon cantoniense*, and another very minute species, raising their clustered, white, globular heads above the clear water, amidst the lively green fronds of *Ceratopteris thalictroides*; whilst way-sides and arid places furnish the ephemeral *Cyanotis axillaris*, and several *Commelynæ*, *Polygoni*, *Alternanthera axillaris*, thorny *Sclerostyles*, *Achyranthes aspera*, *Emilia sonchifolia*, two or three *Sidææ*, our garden *Chrysanthemum* (*Pyrethrum indicum*, D.C.), with single yellow flowers, *Corchorus acutangulus*, bearing a fruit with divergent horns, *Triumfetta angulata* and *T. cana*, and *Urena sinuata*, all three employed by the Chinese, as demulcents and emollients in blennorrhœa and other diseases, on account of the great quantity of mucilage they afford. *Erianthus japonicus*, growing in thick tufts, attains a height of six or eight feet, and elevates its beautiful, light, feathery panicles amongst the rocks. The dark blue berries of *Dianella ensifolia* hang pendulous above its sword-like leaves, along with the cedar-scented *Caryopteris mastachanthus*, and the graceful lilac bells of *Gutzlaffia aprica*.

Amongst ruderal plants, by which I understand all those that, though not cultivated, are yet only found in the immediate vicinity of dwellings, or in places formerly occupied by them, and which appear, in many instances, to follow the footsteps of man spontaneously, I include the following:—*Solanum nigrum*, and another thorny species, with purple flowers and yellow fruit, the size of that of the potato, *Amaranthus spinosus*, *Xanthium discolor*, *Asclepias curassavica*, *Plantago major*, *Psidium*, *Stellaria media* and *S. uliginosa*, *Ranunculus sceleratus*, *Datura alba* (the seeds of which are burnt by burglars, when attempting to enter a dwelling, in order, by their fumes, to stupify the inmates, a device which is, unfortunately, often crowned with success), *Polanisia icosandra*, *Cardamine hirsuta*, *Nicotiana tabacum*, *Bidens chinensis*, *Corchorus capsularis*, *Bryophyllum calycinum*, the singular *Euphorbia tirucalli*, with its leafless, green, quill-like branches, abounding in a violently acrid milky juice, said to be employed, by the Chinese, for blinding those children whom they wish to bring up as mendicants, in order thereby to excite compassion, *Siegesbeckia orientalis*, *Cassia occidentalis*, *Sonchus olera-*

ceus, *Ricinus communis*, of which the two varieties, one with red and the other with pale veins to the leaves, appear never to be found intermixed, *Verbena officinalis*, *Capsella Bursa-pastoris*, a *Galium* closely allied to *G. aparine*, *Rumicis* sp., *Plumbago zeylanica*, *Lochnera vincoïdes*, *Physalis pubescens*, *Bothriospermum tenellum*, *Pedaliium murex*, *Dysosmia foetida*, *Mucuna macrobotrys*, *nob.*, and *Cerbera odollam*.

The *sylvan* Flora consists of seven or eight species of oak, amongst which is a most beautiful one (*Quercus Eyrei*, *mihi*), belonging to the section *Chlamydobalanus* of Endlicher, and nearly allied to *Q. cuspidata*, *Sieb. & Zucc.*, which, however, it excels in all respects, *Liquidambar*, *Synædrys ossea*, the fruit of which, resembling the chestnut in taste, is sold in the markets, an elegant *Styrax*, *Acer*, *Camellia japonica*, and two others, *Vaccinium*, *Cyminosma resinosa*, five or six species of *Euonymus*, *Aquilaria chinensis*, *mihi*, *Memecylon*, an extremely handsome *Castanea*, *Rhodoleia formosa*, *Calauma pumila*, *Artabotrys*, the graceful *Melaleuca*-like *Phoberos sævus*, *mihi*, and *P. chinensis*, *Piper arcuatum*, two species of *Elæocarpus*, *Rhapis flabelliformis*, *Hiptage madablota*, the sweet-scented *Schœpfia sinensis*, &c. At the foot of the hills, on the slopes of which these woods occur, are ravines, whereof the sides are in some places formed by steep rocks, the humid, shady ledges of which are clothed by the lovely *Chirita sinensis*, an exquisite *Cypripedium*, *Renanthera coccinea*, *Pholidota imbricata*, and a few others. Higher up, and in sheltered localities, these woods become in some parts much denser, and assume a far more tropical aspect, as is indicated by the great abundance of *Lycopodia*, and the appearance of *Cibotium glaucum*, *Neottopteris nidus*, and *Psilotum triquetrum*; whilst the trunks of the trees are clothed by a climbing, large, glossy-headed *Anthurium*, and the epiphytal *Niphobolus pertusus*.

At or near the summits of the different peaks, where, from altitude and the free exposure to both monsoons, the temperature is much lower than on the flanks of the hills, a difference of as much as 10° existing in the summer season, the Flora has a more European character. It comprises the pretty, but scentless, *Viola tenuis*, *Lonicera*, *Clematis*, *Polygala Loureirii*, *Polyspora axillaris*, the lovely *Enkyanthus reticulatus*, the "new-year flower" of the Chinese, *Phaius grandiflorus*, *Rhododendron squamatum* and *R. indicum* (the latter so profuse a flowerer, that it looks, at a distance, when brought into relief by the dusky sides of the rocks, or the dry grass, like a bush of fire), the azure *Exacum bellum*, replacing our gentians, *Torenia asiatica*,

Chloranthus inconspicuus, *Cirsium chinense*, *Lilium longiflorum* (affording a magnificent spectacle, with its large, cernuous, white flowers, and the bulbs of which, when stewed, are much esteemed by the natives), a particularly elegant little Composite (*Gerbera amabilis*, *mihi*, in Walp. Ann. Bot. Syst. ii. ined.), and *Ligularia Kämpferi*, confined to the damp ledges of rocks; whilst the deep green, luxuriant carpet of verdure is enamelled by the most beautiful Orchids, such as the golden *Spathoglottis Fortuni*, *Arundina sinensis*, the modest *Spiranthes australis*, *Platanthera Susannæ*, with its laciniated, snowy perianth, *Glossaspis tentaculata*, &c., and the heath-like *Bæckia frutescens*, which, when rubbed between the hands, exhales a most pleasant aromatic odour, springs up in moist places, with a glaucous *Carex*, *Scleria*, and *Lepidosperma*.

The *normal*, or characteristic, species, those which are most widely distributed, most numerous, and which most clearly strike the observer, as constituting the peculiar and distinguishing character of the Flora, are, amidst a thick, but rather coarse, turf, consisting of species of *Cyperus*, especially in damp localities, *Paspalus*, *Chrysopogon*, *Andropogon*, *Anatherum*, *Digitaria*, *Lycopodium cernuum*, &c., *Myrtus tomentosa* (with its gay, rose-coloured flowers, and sober, green leaves, clothed beneath with a close, white down, which is met with everywhere, and may be considered the commonest plant in the island, and the fruit of which, when ripe, has a resinous, not unpleasant taste, somewhat resembling that of the black currant, and is eaten by the natives), *Melastoma calycina* and *M. macrocarpon*, covered with magnificent purplish pink blossoms, *Ancistrolobus ligustrinus* (a pretty, compact shrub, with dark, blood-coloured flowers, smelling like our St. John's-wort), and *Callicarpa tomentosa*, and another with branches hidden in a velvety, fulvous down, lovely, bright green leaves, farinose beneath, and dense bunches of small, reddish lilac flowers. An *Emblica*, very common on the low grounds, is among the first to put forth its delicate, green leaves on the approach of spring, two *Clerodendra*, the neat, myrtle-like *Rospidios vaccinoïdes*, *Strophanthus divergens* (with its trailing branches, dark, glossy foliage, and curious, reddish yellow, caudate corollas), two pretty *Uvariæ*, *Helicteres angustifolia*, *Desmodium triquetrum*, *Dicerma elegans* (to which I refer, without doubt, the *Æschynomene heterophylla* of Loureiro, hitherto undetermined), and *Melanthesa chinensis* are almost equally common. *Alpinia nutans* elevates its gorgeous racemes of flowers, of a light flesh-colour, streaked with the intensest gold and scarlet, by the water-courses; *Ameletia subspicata*

in some parts clothes the flat, moist, meadow-like turf with so thick a verdure, that, when in blossom, it looks, at a distance, like a field of thyme; the silvery foliage of the graceful *Rhus succedaneum* flutters in the breeze, *Smilax glabra* straggles over the rocks, *Lygodium japonicum* and the leafless, parasitical, intertangled *Cassyta filiformis** climb over all shrubs indiscriminately, the latter perfidiously abstracting the sap, with its cup-like suckers, from those plants from which it claims support; and the abundant, pectinated *Gleichenia dichotoma*, with *Pteris nemoralis*, *Adiantum amœnum*, *Nephrolepis tuberosa*, and other ferns, spring up among the herbage.

Finally, to descend to the lower classes of the vegetable world, the few mosses which are found consist of species of *Hypnum*, *Neckera*, *Fissidens*, *Trematodon*, and *Physcomitrium*; the exposed masses of syenite are occasionally clothed with a foliaceous lichen, apparently a species of *Parmelia*; a handsome crimson *Phallus*, covered with a fœtid gelatinous matter, and various agariciform *Fungi*, spring up meteorically amidst the grass, in the hot and damp summer months; whilst *Polyporus sanguineus* and a few others are met with on the bark of trees; and the common mushroom has of late appeared spontaneously, in immense quantities, in a flat, meadow-like valley to the east of the town used as a race-ground, and for the training and exercising of horses. The rocks and sands along the coast afford a few *Sargassa*, and a *Corallina*, which seem to constitute all, or nearly all, the *Algæ*.

The most noticeable feature in the Flora of this island, is the mixture of Asiatic and European forms, especially conspicuous in the vernal vegetation of the hill-summits. In this respect, it appears to approach closely to that of Cashmere. Its connexion with that of

* Though perhaps rather irrelevant to the occasion, I here embrace the opportunity of correcting an oversight which Prof. Ernst Meyer has committed in a note (p. 120) to his edition of the treatise 'De Plantis,' by Nicolas, of Damascus (Lips. 1841), where, in attempting to identify the *Συριακὸν βοτάνιον, κισσύτας, or καδύτας* of Theophrastus, which he presumes, after rejecting the claims of *Cuscuta monogyna*, to be the *Usnea florida*! he remarks that he is acquainted with no other twining parasitic plants inhabiting the East. But there is no doubt that the plant referred to, and which is also noticed by Pliny, is the present one, described by Forskal, under the name of *Volutella aphylla* (Cfr. Sprengel, *Hist. Rei Herb.* i. 90). Fraas also ('*Synopsis Floræ Classicæ*') erroneously refers the *καδύτας*, though with a mark of doubt, to *Cuscuta epilinum*. Situation exercises a great influence on *Cassyta*, for I possess a specimen, gathered close by the sea-shore on Prata Island, south coast of China, which is much fleshier and stouter in its proportions, and has altogether the appearance of a different species, though I believe in no wise distinct.

Australia is very slight, being merely indicated by such genera as *Stylidium* and *Philydrum*, the last of which is exclusively confined to Cochinchina, the south of China, and parts of New Holland. Tropical plants, identical with, or intimately allied to, those of the Indian Peninsula and the Malayan Archipelago, are not unfrequent; and *Anthurium*, *Chirita*, *Æschynanthus*, *Sponia*, *Piper arcuatum*, &c., &c., may serve as examples; but they by no means represent the normal character of the Flora, which is perfectly *sui generis*. The only three indigenous palms are a dwarf, stemless species (perhaps a *Seaforthia*), *Zalacca*, and *Rhapis*. *Cocos* is occasionally planted, but does not thrive, the island of Hainan being its most easterly station in these seas; and even there it is said to perfect fruit sparingly. Its most obvious relationship is, however, with Japan, as evinced by the presence of the new oak above alluded to, half a dozen genera of *Ternströmiaceæ*, and some *Hamamelidaceous* forms (adopting the late Dr. Gardner's views of affinity), as *Eustigma*, *Liquidambar*, and *Rhodoleia*, both families being peculiarly characteristic of the Flora of those islands. How far a resemblance may hereafter be traced between the vegetation of Japan, the south and south-east of China, and some districts of upper India, it is at present impossible to predict; but I may here refer to the distribution of *Abelia* and *Adamia*, and observe that a new *Helwingia* has been detected at Darjeeling, and two species of *Corylopsis* in the Bootan mountains.

Amongst *cultivated* plants, the sweet potato (*Batatas edulis*) holds the first rank. It is very largely consumed by the Chinese, even its boiled leaves being used as greens. We must also notice, as vegetables, yams (*Dioscorea* sp.) and *Colocasia*, several species of *Sinapis* and *Brassica*, *Basella rubra*, employed as a substitute for spinach, various species of *Dolichos*, *Soja*, and *Phaseolus*, egg-apples (*Solanum Melongena*), our common potato and pea, water-melons and other *Cucurbitaceæ*, ground-nuts (*Arachis hypogæa*), a little barley, grown exclusively for pearling, Cassava (*Manihot utilissima*), *Allium fistulosum*, rice, millet, *Setaria*, sugar-cane, maize, *Abelmoschus longifolius*, the immature viscid capsules of which are brought to table; and, as fruit, *Pomelo*, *Citrus Decumana*, oranges, Loquats (*Eriobotrya japonica*), Papaws (*Carica Papaya*), Wangpis (*Cookia punctata*), *Nephelium Litchi* and *N. Longan*, Mangoes, Bananas, pine-apples, *Averrhoa Carambola*, Guavas, and *Jambosa malaccensis*. The farinaceous fruits of *Trapa bicornis*, those of *Canarium album*, preserved with salt, and much resembling an olive in flavour, the crimson, papillose, acid drupe of a species of *Elæagnus*, pears, plums, and peaches, of exceedingly bad

quality, and the amygdaloid nuts and fleshy root of *Nelumbium speciosum* are brought to market, and are all grown in its vicinity, though not in the island itself. *Gossypium herbaceum*, *Boehmeria nivea*, *Piper betel*, and a species of *Indigofera* are cultivated for economic purposes, other than esculent. *Ficus nitida*, whose claims as a true native I consider very doubtful, is planted around the villages; and the fields and garden-patches are surrounded by hedges of *Pandanus fœtidus*, *Euphorbia nereifolia*, or *Curcas purgans*.

H. F. HANCE.

[This article, together with a considerable collection of Chinese plants, was given to me by my friend Dr. Hance, to be freely employed in the Botany of H.M.S. 'Herald;' but, as Dr. Hance has some time ago returned to Hongkong, and will probably be able to send some additional notes, before the portion of my work relating to China is published, I have thought it advisable to insert the present article in the 'Phytologist,' a journal in which Dr. Hance has always taken a lively interest.—*B. Seemann*.]

PROCEEDINGS OF SOCIETIES, &c.

DUBLIN NATURAL-HISTORY SOCIETY.

Friday, February 11, 1853.—George A. Pollock, Esq., in the chair.

The minutes of the previous meeting having been read and confirmed,

Mr. Andrews, one of the Secretaries, said that it was with feelings of the utmost pride and pleasure that he again witnessed the assembling of the members in their old quarters,—rooms in which the Society had flourished and prospered; and he trusted that the times of difficulty had passed, and that the future progress of the Society would be more flourishing and prominent than ever. It was not the intention to give any address upon the occasion, until the rooms were prepared to receive their friends, and the museum carefully arranged. It was in that room, nearly twelve years since, that he (Mr. Andrews) gave his first paper; and he was happy to see that there were young

members, of promise and energy, to enter into the pursuits for which the Society was established.

Undescribed Variety of Blechnum Spicant.

Mr. Kinahan read a paper ‘On an Undescribed Variety of *Blechnum Spicant*.’

The author said :—“It is my intention, this evening, to place on our annals a notice of some varieties, or rather monstrosities, of ferns, most of them unnoticed hitherto in this country, and one, at least, hitherto undescribed. Many authors inveigh against the study of these monstrosities, saying it arises from a depraved and puerile taste; yet the student of morphology must deem them interesting, since it is by the exception the rule is best shown. Again, they may often be of use in distinguishing between two allied species, as we find oftentimes a monstrosity in one species not found in a closely-resembling one. There are, also, strange analogies pervading certain classes, and that irrespective of natural family or outward conformation, the same form of monstrosity sometimes occurring in widely-removed genera. Into these points I will not at present enter more fully, as I hope to return to the subject before the end of your session. I shall now content myself by laying the growing specimens before you, and briefly pointing out their analogies, merely adding that these irregularities of form do not arise, as some suppose, solely from cultivation, as the same form may be found under conditions diametrically opposite, as regards abundance or absence of moisture, a shade, richness or barrenness of soil, &c. The first I shall notice is the striking variety of *Blechnum Spicant*, *Roth*. It was found in July, near Upper Lough Breagh, county Wicklow, and has not been hitherto noticed by any author. The nearest approach to it is a frond figured by Dr. Deakin, in his ‘*Florigraphia Britannica*,’ which is identical with the variety of the same plant of which I now show you specimens, gathered in the counties of Carlow, Clare, and Waterford. To this form, the name of *multifidum* may with propriety be given; while, for that first mentioned, *ramosum* would be appropriate. The two differ materially: first, *multifidum* is inconstant, and not permanent, *i. e.*, neither affecting all the fronds of the plant, nor remaining constant under cultivation; while *ramosum* both affects all the fronds, and remains permanent under cultivation :—secondly, *multifidum* has the apices of the fronds simply dichotomous, and distinct to their extremity, the main mid-vein running out to the extremity of each division of the frond, &c., each of the subdivisions terminating in a

point, and not curled ; while in *ramosum* the apices are subdivided, and the mid-vein terminates in a lash of branches, so that the segments are rounded, and curled on themselves ; in every respect, save their single rachis, bearing a perfect analogy to a form of *Scolopendrium vulgare*, *i. e.*, *ramosum* or *crispum*, where we find the same appearances contrasting with the multifid form of hart's-tongue, as these specimens show. This form of *Scolopendrium* has not, I believe, been found here. I cannot find any forms of any other fern analogous to *Blechnum Spicant* and *ramosum*. The multifid variety, in this country, pervades many other species. It has been found in all the spleenworts, except the wall-rue ; in all the *Lastreas*, except the heath, shield fern, and *L. rigida* ; in all the *Polystichums*, except *P. Lonchitis* ; in the common *Polypody*, the common brake, Killarney fern, and *Grammitis Ceterach* (for which I am indebted to W. H. Luscombe, Esq.), *Botrychium*, and *Ophioglossum*. Of most of these species there are specimens now before you, all gathered in this country, during the last summer, and all agreeing in the general features of being inconstant, not permanent even in the wild plant, and not interfering with the fertility of the frond. The next in our list is the distorted variety of *B. Spicant*. To it, Francis, who describes and figures it in his 'British Ferns,' has given the name of *strictum*. His plants were procured from Ambleside. The plants before you were procured at Glenmacnass, county Wicklow, growing in a cleft of a rock, last July. They have continued under cultivation ever since, without materially altering their character. The only satisfactory analogue to it recorded, is the variety of *L. Filix-mas*, called *abbreviatum*, of which specimens, from Kilmashogue, near Whitechurch, are before you. To the form of the lady fern (*Athyrium Filix-fœmina*), which next engages our attention, several names have been given, of which the least open to objection appears to be *furcatum*. It differs, as you perceive, from the common form in having its pinnæ and the apex of the frond split up into a number of segments, so as to present a tasselled appearance. This specimen was obtained in a hedge-row at Caherpoher, near Feacle, county Clare, growing on clay slate, and has, as you perceive, retained its characters in cultivation. A more singular monstrosity of the same form is figured in Newman's 'British Ferns.' This last was obtained in Mayo, and is remarkable for seeding freely, the seedlings in every respect resembling the original plant. There is also, in the College collection, a fern, obtained at Killarney, by the late Mr. Ogilby, which closely resembles that found by me in Clare ; and Mr. J. Bain, to whom I

am indebted for the careful cultivation of the plants exhibited to-night, informs me that the same form was found by him, some years ago, at Chatsworth. This is the only record of this variety as English, though an allied form (*crispum*) has been recorded in Scotland. This form has been also called, incorrectly, *viviparum*; for the habit of the plant is not viviparous. Another name given to it is *multifidum*, also objectional, as a multifid form of the frond does exist, as this specimen shows, resembling in its characters those multifid forms of other ferns to which I just now drew attention. The only analogue recorded of this is a form of *Lastrea Filix-mas*, to which the same name (*furcatum*) has been given. I should mention that *A. Filix-fœmina*, var. *furcatum*, has been also found in Wicklow. We next in order come to the variety of *Polystichum lobatum*, to which the name of *lonchitidioides* has been given, on account of its resemblance to the holly-leaved shield fern (*P. Lonchitis*). The plants I obtained at Curraghclune Arthur, near Feacle, county Clare, during last August. When cultivated, it is said to resume its original form. It has been recorded as growing at Malone, in Ulster; and I have seen specimens of it sent from Carlow, as *Lonchitis*, but whether wild or garden specimens I cannot say. It is at once distinguished from *Lonchitis*, by the bipinnate character of the lower pinnæ. The fronds are fertile. It is very common in some parts of Scotland. I also show you an analogous state of *P. angulare*, from the neighbourhood of Bray, and a form as yet unnoticed, though I have met with it in many parts of the country. In conclusion, I beg leave again to bring before your Society this variety of *Polystichum angulare*, exhibited before you last session, and to which I then gave the name of *viviparum*, owing to its producing gemmæ in the axils of the pinnules. This is before you now, to show the autumnal fronds, which differ greatly, in their characters, from those produced in the spring, more nearly approaching the character of the typical form. I also beg to submit to you a series of fronds, taken from the plant during each of the years it has been under cultivation, showing you how well the original characters have been preserved ever since."

Dr. Allman, in making some remarks on Mr. Kinahan's paper, referred to the recent discoveries of Count Suminski, concerning the reproductive system of the ferns, and believed that much interest would result from a comparison of the plants produced from the gemmæ described by Mr. Kinahan, in one of the varieties exhibited by him, with those resulting from the germination of the spores. Dr. Allman was, however, of opinion that the spores borne upon the backs

of the fronds of ferns were physiologically identical with buds, and that the history of the development of a fern affords a beautiful example of the "alternations of generations," first pointed out by Steenstrup, as occurring in the animal kingdom.

Mr. Andrews said he was much gratified at the pains Mr. Kinahan had taken to bring forward, and to prove, such varieties of character as many of the more common forms of our ferns presented. Geological characters of country, altitude, exposure or shelter had much effect on the character of growth of plants; and these views should always be noted by the exploring botanist. Varied were the forms to be met with under that of *Lastrea multiflora* and *L. recurva* of Newman, and the *Aspidium dilatatum* of Hooker. *L. recurva*, so frequent in the county of Kerry, is considered to be identical with *Nephrodium Fœnisecii* of Madeira. The forms of *Cystopteris* met with on the limestone rocks of Sligo, and of Clare, were also numerous. The variety of *Polystichum*, according to Mr. Kinahan, producing gemmæ in the axils of the pinnules, was deserving of investigation. The Right Hon. John Wynne, of Haslewood, had cultivated young plants of *Woodwardia radicans* most successfully, producing the growth from the axils of the pinnules. This was a beautiful fern of Madeira and Portugal.

Insects causing the Potato Disease.

Mr. Nuttall read a paper 'On the Insects causing the Potato Disease.'

Mr. Nuttall observed:—"So much has been said and written on the potato disease of late, that the subject appears to have lost its interest; but it certainly has not lost its importance. It is a subject that I have given much attention to for some time. Early in August last, a letter from me appeared in the papers; and since then some objections have been raised to my assertion that the disease was caused by insects. I have now two reports, from scientific friends, before me. One appears to look on the drill-harrow as a sort of infernal machine, and is satisfied that I must be wrong, 'as such views have not been adopted by the scientific world!' Now, being confident that I am right, I have thought it well to bring my views and reasons for them into this, their camp, to be, by them, extinguished, if false, well knowing that truth is a light that cannot be extinguished. Another objects, 'as he has not been able to discover any traces of these insects.' Now, I do not believe that the scientific world is infallible. Some of its members traversed California and Australia,

but left it to a simple shepherd to discover the gold. They are sometimes wrong ; and in the potato disease they have been most unfortunately and pertinaciously so, as I apprehend, very much from want of opportunities for making observations. Thus, when they recommended the taking up of the crop, I left mine in the ground, and came off better than many of my neighbours who lifted theirs. As they did not come in contact in the earth as they would in pits, the disease did not spread. I have made some experiments, to test the power of infection, and found, the first year, that in a few hours a sound tuber would be tainted, when in contact with an unsound one ; and I consider it a good sign that this year the disease is but slightly infectious. To suppose that the same species of insect could not have caused the disease in other parts of the world, is, to say the least, absurd, as every naturalist knows that many of these creatures are common to almost every country, and that some are migratory. The locust, that often lays waste whole provinces in Asia and Africa, has before now visited England. As to the power of insects, look to the formation of coral, see, also, the perforation of the hardest rocks ; and as to the extent of their doings, look to the destruction caused by the cane-fly in the West Indies, another which destroys the meadows of Sweden, and the almost total defoliation and other ruin of vast forests by Aphides. Their fecundity is prodigious ; but I shall not take upon me to say the exact number of fresh eggs they lay in the morning. My friend Mr. Andrews will remember the injury caused by one of the Eriosoma to the silver fir in the county of Wicklow, in 1845, and so well described by him at the time. His plan for banishing them was simple, and most efficacious, and more practicable than that of picking them off, as had been recommended. Soon after the planting of larch-trees in Scotland, they were attacked in a similar way ; and farmers know what the turnip-fly can do in this country. For the last two years, a plant of the *Araucaria imbricata* with me has been attacked by an insect, much resembling, except in colour, the potato enemy, and blackened the leaves of it, and, I think, would have killed the plant, had I not banished them, by dusting with soot. Another was partly blackened ; and, remarking one branch quite green, I was pleased to find that the cause was, that a spider had covered it with his web, and was busily employed with them. Now, I observed a webless spider, last year, very numerous on the potato. Its mission appeared to me to be the destruction of the former insect. I put one in a bottle with about thirty of them, which he killed in an incredibly short time. I have many reasons to hope that, as far as the potato is

concerned, the tide of these insects is about to ebb, and that therefore the disease will disappear, or, at least, go back to its original bounds, as I do not believe it to be of so recent date as is supposed. I have remarked that potatoes have suffered most with a northern aspect. May it not be that these creatures are a squadron of the 'great northern army?' I think it is about 100 years since the curl prevailed to an alarming extent in the south of England; and we still have it in a mitigated form. There are other insects found on potatoes, such as beetles, &c., &c. Some of them have been erroneously supposed to be the enemy, whereas they are waging war upon him. It appears to me that there are two great divisions of insects, those which attack the vegetable kingdom when in health, such as the Aphis, caterpillar, &c., and those which act as scavengers when decay has set in, such as grubs, beetles, &c. In 1847, I had a field of beans blackened in one night. The canker of trees is often, in my opinion, caused by insects. To me, it is rather surprising that a cause so simple, usual, and manifest should be doubted. I have found varieties of these insects on many plants; and in every instance there was the blackened leaf. Is it to be wondered at, the potato, a delicate and not an indigenous plant, being thus injured, and the regular flow of the sap intercepted, that the decay of the tuber should follow? I improved much on the plan that I recommend to sweep off these vermin, the results of which I may possibly bring before you at another time. No doubt, much might be done to check these blights, even in the manuring of the potato. Peat-charcoal or lime has been beneficial, and should be used instead of, or, at least, in conjunction with, other manures. I would also recommend early planting, as the plant would thus have a chance of coming to maturity before being attacked. My potatoes are the best that I have had for years; whilst my neighbours in that mountain district have scarcely any. The oat crop in many parts of Ireland was, last year, what is called blighted. I found, one morning, after walking through a field, that my clothes were covered with what appeared a yellow dust; but I discovered, on examining well, that every particle had life—

‘ Full nature swarms with life, one wondrous mass
Of animals or atoms organised.’

The following day it was not observable. What if the grain crops now are to suffer? Here, also, as with the potato, some varieties escaped better than others; and those sown early were better than those sown late. Now, although we should not be able to do much

to mitigate the ravages of such creatures, surely it would be instructive to look into the minute works of the same hand that formed the most mighty.

‘How sweet to muse upon His skill displayed,
(Infinite skill!) in all that He has made,
To trace in nature’s most minute design
The signature and stamp of Power Divine.’”

Mr. Andrews remarked “that there was no case more difficult to deal with than the present, nor one that has had so many advocates of such extremely opposite views and tendencies. From the earliest date of the introduction of the potato into Britain, the tuber has been subject to failure, from variableness of climate, or unsuitableness of the tuber for planting; in fact, it has ever been a crop of uncertainty. The great extent to which the potato has been cultivated in this country, is encouraged by the economy of its treatment, the poorer lands it can adapt itself to, and, above all other esculent roots, its nutritive properties as a general and daily food for the poorer classes. A short time since I read an article from the ‘Waterford Mirror,’ published more than thirty years since, detailing losses of the potato crop almost as extensive as those of 1845. We must all admit that the ravages of insects have been most destructive to vegetable life, as endless instances, in every part of the world, can be given. When the vegetative and nutrimentative powers of the stems are cut short, whether affected by insect agency or atmospheric causes, the growth of the tuber must be more or less checked, to the destruction of its mature development. My friend Dr. Bellingham, in this Society, in November, 1845, gave a very able statement of the action of electrical influence on the potato crops, detailing very fully the history and the causes of the disease; and, indeed, in some measure his statements were subsequently borne out. Naturalists well know what injuries had been caused by the several species of *Cecidomyia*, as the Hessian fly, wheat-midge, barley-midge, &c. The plant-mite, or red spider (*Acarus tellarius*), is also most destructive to plants, and even to trees. Practical observations are at all times most valuable, and desired by the Society. Mr. Nuttall has most candidly submitted his experience; yet, on a subject still beset with such difficulties, the patient investigations of science must be brought to bear, before sound deductions can be arrived at.”

Mr. Williams said he had noticed the destructive powers of insects to plants. In the greenhouse, the Oleander was so infested as only to be preserved by constant washing.

Mr. Andrews observed that this was a species of scale insect (*Aspidiotus*). The species were peculiar to many plants.

The ballot was then proceeded with ; and the following gentlemen were declared to be elected members :—Robert Barklie, Esq., 106, Lower Gardiner Street ; F. Nuttall, Esq., Tittour, Co. Wicklow ; — Brown, Esq., Mount Merrion ; and Mr. Wakeman, Grafton Street.

The meeting adjourned to the month of March.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, February 10, 1853.—Professor Balfour, President, in the chair.

Various donations to the Society's library and herbarium were announced, among which were the following :—Leaf taken from a lime-tree which had been planted by Linnæus, in his own garden at Upsal. The tree was pointed out to Mr. Elliot (by whom it was presented) by the only surviving daughter of Linnæus.—Two specimens of larch, showing the absence of the tap-root, and the formation of lateral roots. The following particulars were given by Mr. Graham :—The trees were cut in January last, on property 750 feet above the sea-level. They show the mode in which the roots proceed from the stem. These are preserved to show the fallacy of the theory that the main tap-root is necessary for the upright growth of the stem, and that the lateral roots produce only side branches. Each tree was split into two portions, and planed :—1. Height of tree when cut down, 34 feet 2 inches ; girth, 18 inches from ground, 26 inches ; apparent age (calculated from number of rings), 27 years ; length of leading shoot in the year 1851, 6 inches,—in 1852, 4½ inches. The earlier growth of the tree must thus have been pretty rapid, as the average of the annual shoots is 15 inches. 2. Height of tree when cut down, 7 feet 10 inches ; girth, 1 foot from ground, 7 inches ; apparent age, 7 or 8 years ; length of leading shoot in the year 1851, 15½ inches,—in 1852, 16 inches. Neither of the trees had any tap-root. The roots spread out laterally from the base of the stem ; and yet there was no impediment to the growth of the central axis. The specimens were presented by Humphrey Graham, Esq.

Mr. John Laing, gardener to the Earl of Rosslyn, Dysart House, exhibited a plant of *Rhododendron ciliatum* in flower.

Mr. M'Nab stated that *R. ciliatum* was in flower in the Royal Botanic Garden.

Mr. M'Nab showed a flowering plant of *Begonia argyrostigma* in which the leaves, at the upper part of the stem, exhibited no white, scaly markings; and their under surface was of a pale, greenish purple. The leaves on the lower part of the plant showed the usual markings, and the usual dark colour on their under surface.

Mr. Matthews exhibited a new form of dissecting microscope, made by Pellisher, of London.

Mr. G. Lawson exhibited a specimen of *Oxytropis Uralensis*, collected by Mr. A. Buchan, on the West Lomond Hills, Fife, where he discovered the plant several years ago.

Remarks on British Plants.

A paper intituled 'Remarks on British Plants,' by Charles C. Babington, M.A., F.R.S., F.L.S., was read.

The author stated that since the publication of the third edition of his 'Manual of British Botany,' his attention had been directed to several groups of plants, either by the discovery of new native specimens, or by finding that he had taken an erroneous view of them in that work; and that he purposes giving a series of papers to the Society, embodying the results of his recent observations.

In this paper he commenced with the genus *Thalictrum*, of which he described *T. minus*, *T. flexuosum*, and *T. saxatile*. He considers *T. majus* as not a good species, but as being formed out of larger states of each of these three species. He gives revised characters, dwelling particularly on the presence or absence of leaves at the lower joinings of the stem, the nature of the vaginal portion of the petiole, with its auricular appendages, the direction of the subdivisions of the petiole, and of the branches of the panicle, and the form of the carpels.

The next genus to which he called attention was *Polygala*, of which he described *P. vulgaris* and its varieties, *depressa* and *oxyptera*, *P. calcarea* and *P. uliginosa*. He thinks that, in this genus, attention should be paid to the mode in which the leaves are arranged, and to the appearances caused by the different lengths to which the stems extend each year.

The paper was illustrated by specimens from the Edinburgh University Herbarium.

Dyeing Properties of Lichens.

The second part of Dr. Lindsay's paper 'On the Dyeing Properties of the Lichens' was read.

At the last meeting of the Society, Dr. Lindsay stated that, during the last two years, he has been engaged in occasional researches in different departments of the natural history of the lichens, and that lately the subject of their dyeing properties has chiefly occupied his attention. In reference to the latter subject, he has made several extensive series of experiments, with a view to determine the kind and amount of colouring matter furnished by various native species; the processes being suited, in individual cases, for eliminating these matters, and their special application to dyeing and colouring, &c.; but his efforts have been greatly circumscribed, by a paucity of materials to work upon. He would therefore be very glad to receive, from members of the Society or others, any spare duplicate specimens of native or foreign species (which, for his present purpose, need neither be rare nor fine), or any kind of practical information bearing upon the subject in question. He gave a short, but comprehensive, view of the present state of the different branches of lichenology in this country, and on the continent; and showed, from the aggregate amount of information which is at present possessed thereupon, the great necessity there still exists for renewed and extended experimental investigation. The author then considered:—1. The vast importance of this humble tribe of plants in the grand economy of Nature, as the pioneers and founders of *all* vegetation. 2. Their importance to man and the lower animals, as furnishing various articles of food. 3. Their importance in medicine, and especially in its past history, at home and abroad. 4. Their importance in the useful and fine arts, and especially in the art of dyeing. 5. Their affinities and analogies to other cryptogamic families, and to the Phanerogamia. 6. Their value as an element of the picturesque in Nature. 7. Their typical significance.

The author then adverted more especially to the subject of his communication, under the ten following heads:—

1. The colours of the thallus and apothecia of lichens, their causes, and the circumstances which modify and alter them.

2. History of the application of their colouring matters to the art of dyeing.

3. Chemical nature and general properties of these colouring matters.

4. Tests and processes for estimating qualitatively and quantitatively the colorific powers of individual species, with their practical applications.

5. Processes of manufacture of the lichen-dyes, on the large and small scale, in different countries, with the principles on which they are founded.

6. Nomenclature of the dye-lichens, and of the lichen-dyes.

7. Botanical and commercial sources of the same.

8. Special applications of the lichen-dyes in the arts.

9. Commercial value of the dye-lichens, and their products.

10. Geographical distribution of the dye-lichens, with the effect of climate, situation, &c., on their colorific materials.

In the former part of this paper, the subjects mentioned under the 1st and 2nd of these heads were considered, and on the present occasion those included in the 3rd and 4th. Of these four sections of the paper, the following is a very short summary, or synopsis:—

Under the 1st head, the author spoke of chlorophylle, and various organic and inorganic substances which enter into the formation of the colours of the thallus and apothecia of lichens, and of the modifications of these colours depending on various degrees of—1. Exposure to air and light. 2. Temperature. 3. Moisture, &c. 4. Atmospheric vicissitudes. 5. Season of the year. 6. Nature of the gonidic reproduction (*i. e.*, gemmation). 7. Nature of habitat. 8. Organic decomposition. 9. Coalescence of parts, monstrosities, &c.

Under the 2nd section, he traced historically the manufacture of lichen-dyes, and the native use of lichens as dye-agents, among different nations, from the times of Theophrastus, Dioscorides, and Pliny down to the present day; sketching briefly the ancient and modern history of orchil, cudbear, and litmus, and specifying the native use of lichen-dyes in different countries of Europe, Asia, and America. He alluded more particularly to their application to the dyeing of yarns, &c., by the Scotch highlanders, under the name of “crottles.” “The process of manufacture of the various crottles, generally consisted in macerating the powdered lichen for two or three weeks in stale urine; exposing the mass freely to the air, by repeated stirring, and adding lime, salt, alum, or argillaceous and other substances, either to heighten the colour, or impart consistence. To such an extent did this custom at one time prevail, that, in several of our northern counties, each farm and cottage had its tank or barrel of putrefying urine,—a homely, but perfectly efficient, mode of generating the necessary amount of ammonia. In the county of Aberdeen

in particular, every homestead had its reservoir of 'graith;' * and the 'lit-pig,' † which stood by every fire-side, was as familiar an article of furniture in the cots of the peasantry as the 'cuttie-stool,' or the 'meal-girnel.' So lately as 1841 (and I presume the practice continues to the present day), Mr. Edmondston stated that, of four or five native dyes used by the Shetlanders to colour cloth and yarns, two, at least, were furnished by lichens, *viz.*, a *brown* dye from *Parmelia saxatilis*, under the name of 'scrottyie,' and a *red* one from *Lecanora tartarea*, under that of 'korkalett.' It is very probable, however, that steam and free trade have gradually dispelled this good old custom, even in the remoter corners of our island; machinery-made articles being now readily supplied at a rate so extraordinarily cheap, as to render it absolutely expensive (as to time, if not also as to money) to prepare colours, even by a process so simple and inexpensive as that just mentioned."

Under the 3rd head, the author examined, in a general way, the chemistry of the colorific and colouring matters of the lichens, and the results to which it has led, avoiding as much as possible the technicalities inseparable from such a subject, and giving a short *visé* of the researches of Heeren, Kane, Rochleder, Heldt, Stenhouse, Schunck, Laurent, Gerhardt, and others. "Our untaught senses should undoubtedly lead us to expect the lichens, whose thallus exhibits the brightest tints, to yield the finest dyes, and these, too, of a colour similar to that of the thallus; but experience teaches us that the beautiful reddish or purplish colouring matters are producible, in the greatest abundance, by the very species from which we should least expect to derive any, *viz.*, in those most devoid of external colour. This, though at first sight very remarkable, is easily explicable, when we remember that, in most of the so-called dye-lichens, colorific principles exist in a colourless form, and only become converted into coloured substances under a peculiar combination of circumstances.

"Some lichens contain colouring matters ready formed; and these exhibit themselves in the tint of the thallus of the plants; *e. g.*, chrysophanic (or parietinic) acid in *Parmelia parietina*, and vulpinic acid in *Evernia vulpina*. In other species, we find principles which, while in the plant, and unacted on by chemical reagents, are colourless; but which, when the lichens are exposed to the combined influence

* The vernacular name for stale or putrid urine.

† "Lit" was the name applied to the plant from which the dye was to be prepared; and "pig" is the Scotch synonym for any kind of earthenware vessel in which the maceration was generally carried on.

of atmospheric air, water, and ammonia, yield coloured substances. This series of coloured products is usually comprehended, more for convenience' sake than on account of chemical identity, under the generic term orceine." The whole subject of the chemistry of these bodies is at present in a most unsatisfactory condition, demanding fresh investigation and research, in illustration of which the author exhibited tables of the colorific and colouring principles, so far as they are at present known, showing their chemical formulæ, and the authority therefor, and various relative information. "It is highly probable that, when the chemistry of the lichens has been more fully studied, and the whole subject of their colour-educts and products better understood, we shall begin to reduce the present confused mass of complex substances, and find the same principles more extensively diffused through different lichen species." Dr. Lindsay entered somewhat minutely on the chemical reactions of the better-known colorific and colouring principles, and their derivatives, so far, at least, as these throw any light on the production and transmutation of the red or purple colours extracted from what may be termed, *par excellence*, the dye-lichens. After a few remarks on the chemical constitution of orchil and litmus, as given by Kane, Gelis, Pareira, and others, he discussed the subject of decolorization of weak infusions of orchil and litmus by exclusion of atmospheric air, and by various deoxidizing agents, and the various theories as to the causation of this phenomenon. "I have repeatedly had occasion to notice that, when weak infusions of these substances are excluded for some time from atmospheric air, in a bottle with a tightly-fitting cork, they gradually lose colour, but rapidly regain it on re-exposure. It is curious that both orchil and litmus are what are called transient or false colours, *i. e.*, they slowly lose their bloom and tint by long exposure to the atmosphere. The colouring matter therefore appears to be decolorized, both by exposure to and exclusion from the air,—phenomena, apparently, of very opposite characters. The cause of the latter phenomenon has never, so far as I am aware, been quite satisfactorily explained; but it has been variously supposed to be due—

"1. To the mere negation of oxygen.

"2. To the development, in the liquids, of various substances capable of exerting a decolorizing influence on the colouring matter.

"3. To deoxidation of the colouring matter by substances which have a great tendency to become oxidized or peroxidized; *e. g.*, hydrogen in the case of decolorization by sulphuretted hydrogen, nascent hydrogen, and the protoxides of iron and tin, &c.

“4. To the fixation of an additional amount of hydrogen in a new colourless body, formed by the union of the sulphuretted hydrogen or other substances with the colouring matter of the liquid. This view is chiefly supported by Kane, who says, ‘that precisely as the colouring matters combine with water, to form different shades of red-coloured bodies—with ammonia, to produce a series of bodies, which are blue and purple—so they combine with sulphuretted hydrogen, to form colourless compounds in solution, which, if solid, would very probably be white.’ He supposes, in a word, that for every coloured substance existing in orchil and litmus there is a corresponding white one, producible by the action of sulphuretted hydrogen, &c. ; and in proof of this theory he mentions having obtained from azolitmine and betaorceine colourless bodies, to which he gave the respective names of leuco-litmine and leuco-orceine.”

The author then gave a short summary of Dr. Westring’s experiments on the dyeing powers of the Swedish lichens, which, he found, might be conveniently divided into four classes, according to the degree of heat employed in their maceration, *viz* :—

1. Lichens whose colouring matter was easily extractable by *cold* water alone.

2. Those which required, for the elimination of their colouring matter, maceration in *tepid* water (*i. e.*, below 25° Swedish thermometer).

3. Those which required maceration in *warm* water (*i. e.*, between 50° and 60° Swedish thermometer).

4. Those requiring *boiling* water, alone or with the aid of solvents.

“It must be admitted that our knowledge of the true nature of the colorific and colouring principles of the lichens is as yet very imperfect and confused ; and one great cause of the dubiety and obscurity overhanging the subject, is the fact that different analysts have arrived at most opposite results, even in the examination of the same species. For instance, *Roccella tinctoria*, which has, of all the dye-lichens, been most frequently selected for analytical investigation, on account of its important product, orchil, the discrepancies between the results obtained are very striking. In it, Heeren discovered his *erythrine* ; Kane, *erythriline* ; Schunck, his *erythric acid* ; and Stenhouse, three different substances, in as many varieties of the plant ; all of these bodies differing more or less from each other in composition and properties (at least, if we are to assume as correct the descriptions given of them by their respective discoverers).”

“I have already hinted that there is no ratio between the external

and internal colour or structure of a lichen, and the kind or amount of colouring matter it will be found to yield. It is exceedingly natural to suppose that such a ratio should exist; but, proceeding for some time on this supposition, I was frequently disappointed in my results; the most showy and brilliantly-coloured lichens often furnishing the dullest and most worthless colours. For instance, the bright yellow thallus of *Parmelia parietina*, and the beautiful scarlet apothecia of *Scyphophorus cocciferus*, instead of producing a rich yellow in the one case, and a deep crimson in the other, yielded, respectively, only dirty greenish-yellow and brownish colours. As a general rule, I should almost be inclined to say, that the finer the colour of the thallus of any given lichen, the more is that lichen to be suspected of poverty in valuable colouring matters; and that, on the other hand, the palest pulverulent or crustaceous species, especially such as are saxicolous, may be expected to yield the most beautiful and valuable pigments (*e. g.*, the *Roccellas* and *Lecanoras*). In such circumstances, it is necessary to have some test, of easy applicability, of the kind and amount of colorific properties of any lichen; and this, fortunately, is readily attainable."

The 4th section of the paper was devoted to the consideration of the various tests of colorific power which have been recommended by different authors. "Of these, the greater number proceed on the principle of developing the colouring matter by some alkali, in conjunction with the decomposing action of atmospheric oxygen and water; others are founded on the reaction between the colorific principles of certain of the dye-lichens, and some of our ordinary chemical reagents." The author noticed in particular—

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| 1. Helot's test | } qualitative. |
| 2. Westring's tests | |
| 3. Stenhouse's test | |
| 4. „ | quantitative. |

"Helot's test consists in digesting the dried and powdered lichen for a few hours, at a temperature of 130°, in a weak solution of ammonia, sufficiently strong, however, to be tolerably pungent.

"Dr. Westring recommended simply macerating three or four drachms of the lichen in cool spring water, assisting, perhaps, the solvent action of the water by minute quantities of common salt, nitre, quicklime, sulphate of copper or iron, or similar reagents. If these means failed after a sufficient length of time had been allowed for the development of colour, he digested a fresh portion of the pulverized lichen, in water containing small quantities of sal ammoniac

and quicklime (in the proportion of 25 parts of water, 1-10th lime, and 1-20th sal ammoniac for every part of lichen), for a period varying from eight to fourteen days; and by this process, he says, he never failed to develop all the colour which the plant was capable of yielding.

“Dr. Stenhouse, of London, one of our latest and best authorities on the chemistry of the lichens, adds to an alcoholic infusion of the lichen a solution of common bleaching-powder (chloride of lime), whereby, if it contain certain colorific principles capable of developing, under the joint action of air, water, and ammonia, red colouring matters, a fugitive, but distinct, *blood-red colour* will be exhibited. The amount of this colorific matter may be estimated quantitatively by noting the quantity of the chloride of lime solution required to destroy this blood-red colour in different cases; or the same result may be obtained by macerating, for a short period, in milk of lime, filtering, precipitating the filtered liquid by acetic or muriatic acid, collecting this precipitate on a weighed filter, drying at ordinary temperatures and again weighing.”

The author entered into a full analysis of these tests and processes, pointing out their respective advantages and disadvantages, and showing their practical value and applications. He stated that he had made use of these and various other tests in upwards of 300 experiments (the details of which he at present reserves); and the one which he employed to the greatest extent, because most uniformly applicable, was Helot's ammonia test. The following combination is that most favourable for the development of the colouring matter of the lichens, *viz.*, the presence

1. Of *water*, as a solvent menstruum;
2. Of atmospheric *oxygen*;
3. Of *ammonia*, in the state of vapour, or in solution; and
4. Of a moderate degree of *heat*.

And according as the proportion of these combining elements varies, so do the kind and amount of colour educed by them. This combination is the foundation of all the processes for the manufacture of the lichen-dyes throughout the world, however different they may appear to be in detail or results.

“I believe it may come to be a matter of great commercial importance to discover, at home or abroad, some cheap and easily procurable substitute for the Roccellas, which are gradually becoming scarce, and consequently valuable in European commerce, having sometimes fetched, in times of scarcity, no less than £1000 per ton.

No plants can be so easily collected and preserved as lichens, requiring merely to be cleaned, dried, pulverized, and packed ; and, if their bulk be an objection to transport, their whole colorific matter may be collected in the way I have already mentioned. Ascending to the verge of eternal snows, and descending to the ocean-level, with a geographical diffusion that is coextensive with the surface of our earth, it is difficult to say where lichens shall not be found. There are myriads of small, rocky islets in the boundless ocean, and there are thousands of miles of barren, rocky coast and sterile mountain-range in every part of the world, which, though at present unfit to bear any of the higher members of the vegetable kingdom, yet are carpeted and adorned with a rich covering of lichens, and of those very species, too, which I have already spoken of as most prolific in colorific materials. I sincerely believe, therefore, that a more general attention to the very simple tests just enumerated, would ultimately result in a greatly more extended use of the lichens as dye-agents. What renders it very probable that efforts in this direction are likely to meet with success, is the great similarity of species found all over the world. It has been repeatedly noticed that the European species, which, of course, are best known, differ little from those of North America. Dr. Robert Brown remarked the same fact with regard to New-Holland species ; and Humboldt also recognized the similarity in natives of the South-American Andes. Of a large collection made by Professor Royle, in the Himalayas, Don pronounced almost every one to be identical with European species. From examining the raw vegetable products sent by different countries to the Great Exhibition of 1851, I am satisfied that even now there are many fields open for the establishment of an export trade in Roccellas and other so-called orchella-weeds. I there saw specimens of good dye-lichens from almost every part of the world, including our own young colonies ; and as a single instance of their probable value I may introduce here the copy of a note appended to a specimen of orchella-weed, from the Island of Socotra, contained in the Indian collection of that Exhibition :—‘ *Abundant*, but *unknown* as an article of use or commerce. Also abundant on the hills around (Aden), and *might* be made an article of trade. Aden, April, 1847.’ Roccellas from this source are estimated as worth £190 to £380 per ton. I believe that a similar statement might be made with regard to the countless islands of the broad Atlantic and Pacific, which may at some future period, perhaps not far distant, be found to be rich depôts of orchella-weeds, just as some of them are at present rich fields of guano ; and may, as such,

become new nuclei of British commerce and enterprize. Even at home, in the immediate vicinity of Edinburgh, or, to restrict our limits still more narrowly, within the compass of Arthur's Seat, there are not a few very good dye-lichens, which require merely to be scraped, with an old knife or similar instrument, from the rocks to which they adhere, and subjected to the ammonia process already mentioned. Of twelve specimens thus collected at random one morning, I found no less than three yielded beautiful purple-red colours, apparently as fine as orchil or cudbear; while the others furnished rich and dark tints of brownish red, brown, and olive-green."

Dr. Lindsay's communication was illustrated with specimens of colouring matters yielded by various lichens collected in the neighbourhood of Edinburgh, &c.

Asplenium germanicum, &c., at *Kyloe*, *Northumberland*.

A paper by George R. Tate, Esq., 'On the Occurrence of *Asplenium germanicum*, *Convallaria Polygonatum*, and other Rare Plants, at *Kyloe*, *Northumberland*,' was read.

Mr. Tate remarked that, during a botanical excursion in the autumn of last year, he had visited *Kyloe* Crag, in *Northumberland*, for the purpose of gathering *Asplenium septentrionale* and *Convallaria Polygonatum*. "These crags are chiefly composed of rudely-columnar basalt, resembling the trap-range of *Salisbury* Crag. Sandstone comes out from beneath this, and at the western end forms a steep cliff. After botanizing for a short time, I had the good fortune to find the *Asplenium germanicum* growing sparingly upon the basalt. It is not a fern easily passed by: its pale green fronds at once attracted my attention; and a closer examination readily enabled me to determine its species. The few specimens I observed were remarkably luxuriant, so much so, indeed, that I counted upwards of thirty fronds growing on a single root. There appeared to be no possibility of the plants having been introduced. This *Asplenium* is most nearly allied to *Asplenium Ruta-muraria*, from which, and from the other species of the genus, it is distinguished by its alternately pinnate frond, narrow, wedge-shaped pinnules, and entire involucre. Some regard *Asplenium germanicum* as a variety of *A. Ruta-muraria*; but, as the latter does not occur at *Kyloe* Crag, or in their vicinity, the supposition is by no means probable. *A. septentrionale* still exists, in considerable abundance, on the high and exposed portions of the crag, as well as among the *débris*. Many of the specimens, especially those in the latter situation, are of large

size. I succeeded in obtaining *Convallaria Polygonatum*, in fruit. This plant was recorded by Wallis, in his 'History of Northumberland.' Since his time, no one appears to have gathered the species; and it was supposed that it had either become extinct, or the name had been misapplied, until, after the lapse of more than 100 years, it was re-discovered by the Berwickshire Naturalists' Club, in 1849. Specimens are obtained with great difficulty: many of them are inaccessible. *Viola hirta* and *Euonymus europæus* occur sparingly. Opposite the crags on the moor, I observed *Lycopodium Selago*, and a variety of *Pinguicula vulgaris*, with a larger flower than usual, and with a spur notched at its extremity."

Mr. M'Nab gave the following list of plants in flower, in the open air, in the Royal Botanic Garden, on the 1st of February, 1853:—*Eranthis hyemalis*, *Galanthus nivalis*, *Potentilla Fragariastrum*, *Sisyrinchium grandiflorum*, *Helleborus odorus*, *H. orientalis*, *H. niger*, *H. viridis*, *H. atro-rubens*, *H. olympicus*, *H. olympicus rubra*, *Rhododendron atrovirens*, *Hepatica triloba* (numerous varieties), *Aubretia grandiflora*, *Primula vulgaris*, *Lamium album*, *Tussilago fragrans*, *Daphne Mezereum*, *D. Laureola*, *Erica herbacea*, *Cornus mascula*, *Knappia agrostidea*, *Tritonia media*, and *Viola odorata*.

The following gentlemen were elected Resident Fellows of the Society:—John Sutherland, Esq., Surgeon, H.E.I.C.S., 8, Hope Street; and William G. Johnston, Esq., Greenbrae Cottage, Dumfries. Mr. Neil Stewart, Artist, 8, Roxburgh Terrace, was elected an Associate.

Thursday, March 10, 1852.—Professor Balfour, President, in the chair.

Donations to the library and herbarium were announced as follows:—From Messrs. P. Lawson & Son, the new edition of their '*Agrostographia*;' and from Dr. Holden, a collection of plants from the neighbourhood of the Cape of Good Hope.

Dr. Holden made some remarks on the Cape plants presented by him, and exhibited a double prickly from a *Mimosa*; the length of each division of the prickly being four or five inches. He stated that insects frequently perforate the prickles, and form their habitations within them.

Professor Balfour exhibited, from the Royal Botanic Garden, a plant of *Acrostiche ramiflora* in flower, and made some remarks on

its characters. He also called attention to a specimen of *Hibiscus* in flower, from Ceylon, sent to the Botanic Garden by Admiral Mitford. It appears to be *H. furcatus*.

Mr. Laing, gardener to the Earl of Rosslyn, Dysart House, exhibited a plant of *Rhododendron glaucum* in flower; also *Lomatia silaifolia* in flower.

Dr. Lowe exhibited specimens of branches of apple-trees showing peculiar wart-like excrescences, which were said to be produced by a species of *Aphis*.

Dr. Balfour exhibited various recent donations to the Museum of Economic Botany at the Royal Botanic Garden, among which were the following, from Dr. Holden:—Specimen of caoutchouc from an African *Euphorbia*; specimens of a plant said to be used in the Mauritius as a febrifuge, and in cases of indigestion, called “*Japana*,” or “*Tapana*,” and of another plant, called “*Koma Koma*,” or worm-root, used as a vermifuge, from Fort Murray.

Palms, Bamboos, Pines, &c., on the Himalaya.

A paper by Major Madden, H.E.I.C.S., F.R.S.E., ‘On the Occurrence of Palms and Bamboos with Pines, and other Northern Forms, at considerable elevations on the Himalaya,’ was read.

In this paper, the author gave an account of various plant-forms which are met with in the Himalaya, and showed the association of plants, which are often said to represent tropical forms, with others which are said to be characteristic of temperate or cold regions. He noticed *Phoenix humilis*, *Chamærops Khasyana*, *Harina oblongifolia*, species of *Arundinaria*, *Thamnocalamus*, *Musa*, *Quercus*, *Acer*, *Rhododendron*, *Pinus*, &c., growing at elevations varying from 5 to 10,000 feet. He concluded by drawing the attention of geologists to the importance of these facts, as bearing on their views in regard to the climate of former epochs of the earth’s history; and by showing that in drawing inferences as to climate we can only do so safely by a consideration of the individuals of each species, and not by that of the whole species of a genus. When we find species of palms, bamboos, and banana growing amongst and above pines, cedars, oaks, cypresses, yews, maples, hazels, and ash, it seems to be very rash to draw conclusions, in regard to climate, from mere generic data.

The paper was illustrated by large drawings of the principal palms, &c., noticed, and also by plants of *Phoenix humilis*, from the Royal Botanic Garden (presented to the Garden, by Mr. Moore, of the Glasnevin Garden); the hemp-palm of China (presented by Messrs.

Standish and Noble, of the Bagshot Nurseries); *Arundinaria falcata*; &c.

In remarking upon Major Madden's researches, Professor Fleming observed that their results were peculiarly gratifying to him, in so far as they afforded another proof of views which he had endeavoured to argue for more than a quarter of a century.

Hypericum anglicum, *Agrimonia odorata*, and *Matricaria maritima*.

The second part of Mr. Babington's paper intituled 'Remarks on British Plants' was read.

In this paper, the author described some newly-observed British species.

Under *Hypericum Androsæmum*, he described a plant, found by Dr. Balfour, at Glanmire, near Cork, in August last, which differs from that species in its winged pedicels, more acute leaves, narrow calycine segments, which do not enlarge in fruit, long petals (twice the length of the calyx), long styles, equalling or exceeding the stamens, and oblong, acute capsule. The plant seems to be *H. anglicum*, *Bertol.*

Another plant mentioned was *Agrimonia odorata*, distinguished from *A. Eupatorium* by the tube of the fruit being bell-shaped, not furrowed, and the exterior spines of the fruit declining.

The author concluded by giving the characters of *Matricaria inodora*, with its var. *salina*, and *M. maritima*. He is disposed to consider these two plants as good species, although the characters are not easily defined. The latter has a diffuse stem, fleshy leaves, basal leaflets few, and separated from each other, phyllaries oblong, blunt, scarious (pale), entire (not torn) in their margins.

Dr. Balfour stated that the *Hypericum* called *H. anglicum* had been observed by him, in large quantity, apparently wild, on the banks of the Glanmire River, near Cork. The plant had also been seen by Mr. Sibbald, at Aghada; and Dr. Balfour exhibited a specimen picked by him near Culross, in July, 1833, which seemed to be the same plant. Another specimen, gathered near Galway, in August, 1838, resembled the *H. anglicum* in the size of its petals, length of styles, and form of capsule.

Dr. Balfour exhibited a specimen of *Matricaria maritima*, from Marseilles, which seemed to differ, in its remarkably pale phyllaries, as well as in its leaves, capitulum, and habit, from any British form he had seen.

Remarkable Formation of a Stem-root in a Willow.

A paper by John Lowe, Esq., of Gainsborough, 'On a Remarkable Formation of a Stem-root in the Decayed Trunk of a Willow,' was read. The paper was communicated by Dr. Balfour.

A sketch was exhibited of a large willow, in which a root had been developed, in a peculiar manner, so as to form a main stem. Mr. Lowe observed:—"The tree (*Salix viminalis*) having become decayed in the centre, a root had evidently been sent down by a portion of the upper extremity of the tree, through the rotten, sponge-like substance which filled up the interior. Feeding upon this, and the moisture absorbed by it, the root at length reached the ground, where it established a firm hold. The circumference then died away, until, the root now taking on the functions of the stem, and becoming entirely denuded, at length became the only support of the living top. The remaining part of the periphery only acts as a mechanical support. The circumference of the root-stem is eighteen inches at top, and thirteen at the bifurcation, and about three feet above the ground. It has latterly taken on more stem-functions, by putting forth several branches. The tree is growing near Sleaford, where I have observed its progress for some years."

The reading of several papers was delayed till the next meeting of the Society.

A. G. More, Esq., of Trinity College, Cambridge, was elected an Ordinary (Non-Resident) Fellow.

THE PHYTOLOGICAL CLUB.

A Botanical Association has recently been organized, with the above title. Its objects are thus stated:—

"The Phytological Club is established by individuals connected with the profession of Pharmacy, who have associated themselves for the purpose of mutual assistance in botanical pursuits. Amongst its means for effecting this object, are the following:—The formation of an herbarium of reference, the exchange of specimens between members, the collection of facts relating to the popular uses of indigenous plants, and correspondence with botanists in other countries, when opportunities offer."

The first meeting of the Club was held on Monday evening, March 7, 1853; the President, Robert Bentley, Esq., F.L.S., in the chair.

Donations to the herbarium were announced as follows:—Specimens from the South-Sea Islands, by Mr. E. May, Jun., Tottenham; British plants from Messrs. Brady (Leeds), Copney (Plymouth), Parker, and Reynolds (London).

The President gave an inaugural address, which was listened to with much interest.

A paper by Mr. H. B. Brady, of Leeds, announcing a new Yorkshire station for *Hymenophyllum Tunbridgense*, was read.

Effects of Ammonia upon Vegetation.

Mr. Penney presented a translation of M. Ville's papers 'On the Effects produced upon Vegetation by Ammonia added to the Air,' which were published in the 'Comptes Rendus' of October 4 and November 2, 1852.

Henry Deane, Esq., Vice-President of the Pharmaceutical Society, sent a communication confirmatory of M. Ville's statements, being an account of some experiments, made at various periods during three or four years, upon plants in greenhouses. The plants were watered with solutions of ammoniacal salts; and the resulting phenomena were similar to those recorded by M. Ville.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-third Sitting.—Saturday, March 26, 1853.

MR. NEWMAN, President, in the chair.

Gymnogramma leptophylla in the Channel Islands.

The President had heard, through the kindness of his friend Mr. Henry Hagen, that this pretty little species had been found growing on a bank in Jersey. It appears that the late lamented Mr. William Christy, so well known for his enthusiastic love of botany, resided for some months near the spot where the species occurs; and it is also a fact that *Gymnogramma leptophylla* was a fern which Mr. Christy took great pleasure in cultivating, raising it, year after year, from seed; but no evidence has yet been offered to show that he attempted to introduce it into the Channel Islands.

Nees von Esenbeck.

The President had received the following letter from Professor Nees von Esenbeck :—

“ Breslau, March 8, 1853.

“ Respected Sir and Friend,

“ I beg to acknowledge, with feelings of most sincere gratitude, the receipt of £20, for which I am entirely indebted to your exertions. I wish to express to you, and to every one, that the sympathy which has rescued me from the most bitter want originated with yourself. Subsequently to your advocacy of my cause, my old friends and fellow-labourers, Robert Brown, Hooker, and Wallich, have assisted me with extreme benevolence ; but to you belongs the high merit of having first recognized my distress, and of having afforded help at the right time. For this, may God reward you. My blessings, and those of my family, will ever accompany you.

“ My sufferings are now so far relieved, that my daily requirements are fully provided for ; and I can now resume my works for the Academy of Natural Philosophy. Still, I am yet unable to accomplish what I ardently desire, namely, the laying by a few hundred dollars, the income from which might, with rigid economy, save me from ever again falling into want.

“ You will perceive that I address you as a friend ; and I wish the sentiments which I have expressed published to the world, through the medium of your journals ; and my thanks thus communicated to those who have so nobly contributed to my support.

“ With my whole heart, I am, and remain,

“ Yours gratefully,

“ NEES VON ESENBECK.”

“ To Edward Newman,
&c., &c., &c.”

Asplenium viride at Danny.

The President had received a communication from a friend, calling his attention to a fact noticed in Derham's ‘Remains and Life of Ray,’ namely, that that great botanist was a resident at Danny at the latter end of 1667, and for a portion of 1668. This suggested the idea that *A. viride*, as well as *Ceterach* and *Dryopteris*, may have been introduced to the locality, two hundred years ago, and have maintained a footing ever since ; the locality being hardly likely to

produce the three species mentioned, without some assistance from the hand of man. He wished the information as to *Dryopteris* were more complete.

Stems of Ferns as an Article of Food.

The following extract from 'Travels in Tartary, Thibet, and China,' by Mons. Huc, was read :—

“A dish much distinguished in our esteem, was furnished by a plant very common in France, and the merit of which has never yet been adequately appreciated; we refer to the young stems of Fern; when these are gathered quite young, before they are covered with down, and while the first leaves are bent and rolled up in themselves, you have only to boil them in pure water to realize a dish of delicious Asparagus.”

BOTANICAL SOCIETY OF LONDON.

Friday, February 4, 1853.—Arthur Henfrey, Esq., V.P., F.R.S., in the chair.

The following donations were announced :—‘Reports by the Juries on the Subjects in the 30 Classes into which the Exhibition was divided;’ presented by the Royal Commissioners. ‘Second Report of the Commissioners of the Exhibition of 1851;’ presented by the Commissioners. ‘Journal of the Royal Agricultural Society of England;’ presented by the Society. ‘Quarterly Journal of Microscopical Science;’ presented by the publishers. The ‘Zoologist’ for January, 1853; presented by Mr. E. Newman. ‘Journal of the Statistical Society of London;’ presented by the Society. ‘Report of the Council of the Art Union of London, for 1852;’ presented by the Council. ‘Journal of the Society of Arts;’ presented by the Society.

Mr. Richard Bardin presented a collection of plants collected by him on the last expedition sent in search of Sir John Franklin.

Mr. A. Irvine exhibited a specimen of *Asplenium fontanum* collected at Ashford, near Petersfield, Hants.

Mr. J. T. Syme read a paper, being ‘Notices of the Localities of Rare Plants in the Neighbourhood of London.’ (See p. 859).

Supplementary Account of the British Rubi, with Remarks on their Physiology and Distribution. By EDWIN LEES, Esq., F.L.S.

THE editor of the 'Phytologist' having reprinted the description I gave of the fruticose Rubi in my 'Botany of the Malvern Hills,' under a *general* title, it almost renders it necessary for me to attempt to make the subject more perfect, by adding those forms which did not come under my notice in the Malvern Flora. Some misapprehension may otherwise occur, as it may be supposed that I have mentioned all the British species that I was acquainted with.

It may be well here, also, to hint to the observer a point not constantly noted, or properly acted upon, as to what is really a type, and what only a variety, amongst brambles. An excessively-developed form, however fine or characteristic it appears at first sight, may be generally presumed an over-luxuriant individual, and not the general appearance of the species. Thus, the type of *R. cæsius* is the universal prostrate form, with its well-known pruinose stem, which, when supported in hedges or thickets, often assumes a much more robust and branching aspect, and in the remarkable var. *pseudo-Idæus* is firm and suberect. Applying this principle to other forms, a clew is obtained to their origin; and I have thus identified the overgrown *R. Schlechtendahlii*, *W. & N.*, as completely connected with my *R. amplificatus*, so common in most of our woods. The same rule applies to the well-marked *R. Sprengelii*, with which Dr. Bell-Salter has curiously combined the names of four botanists—Sprengel, Borrer, Wilson, and Weihe. But, as the three described appearances of this bramble, α ., β ., and γ ., are assigned as *Borreri*, *Wilsoni*, and *Weihei*, the wreath left for poor Sprengel in this arrangement is scarcely distinguishable. Mr. Babington has reversed the matter, in his Manual, by giving Sprengel the second place, as β .; but surely the typical form ought always to coincide with the specific name. In fact, in its commonest form *R. Sprengelii* grows, in its woody habitat, *prostrate*, and with short flowering stems, in analogy with *R. cæsius*; and in exposed places it becomes more tall, upright, and thorny. This is the variety termed *Borreri*, and, in agreement with my observation, must rank accordingly; though it might be preferred that the eminent British botanist should have a species of his own, as Dr. Bell-Salter no doubt intended. But botanical honours are often transient; and the rude foot of the "lumper" crushes remorselessly the hope of immortality based only on a name. By the same analogy

of growth I have been mentioning, I infer that Mr. Babington's "pyramidalis" is, in fact, a dilated form of *R. Menkii*, *W. & N.*, for I have distinctly traced the connexion between the two; and intermediate states occur; but *Menkii* is the smaller and typical form. Mr. Babington has himself marked this rule with correctness of observation, under *R. Guntheri*, to which I agree, with him, that *R. thyrsoflorus*, *W. & N.*, is to be referred, as an overgrown variety; and what I called *R. thyrsoflorus*, in Steele's 'Handbook,' from Devonshire specimens, now proves to be decidedly a large thyrsofloral variety of *Guntheri*.

I am not very well acquainted with *R. Salteri*; but Dr. Bell-Salter has referred my friend Bloxam's "Balfourianus" to it, as a variety, which fully coincides with my ideas, as this last I know to be quite a gigantic bramble, with very large foliage, and a widely-dilated panicle. Indeed, most permanent forms of bramble will be found to have a variety with long thyrsoform panicles; and both *R. fuscus* and *R. Bellardi* well display this. So, also, does the var. *macroacanthus* among the hairy-stemmed *Rubi*.

It is now generally admitted that the fruticose brambles are not strictly biennial shrubs; and I have named the principal division of the group "subperennial," as existing for an indefinite time, though not absolutely *perennial* like a rose-bush. If circumstances are unfavourable to the barren shoot of the year rooting in the ground, it throws out other proliferous barren shoots the second year; and thus the system of vitality is maintained for a considerable period.* In fact, many brambles are almost evergreens, flourishing through the winter, if no very severe frosts intervene. I have noticed numerous old shrubs of *R. discolor*; and one of *R. Schlechtendahl*i, in Cowleigh Park, near Great Malvern, has maintained itself, to my knowledge, for more than fifteen years. It has now enormously thick stems. Thus, an underwood of bramble of one particular kind will long remain in a copse, till suddenly its vitality becomes exhausted, and a wide extent of withered thorns meets the surprised eye of the observer, not to be renewed, exactly in that spot, for years to come. The sub-erect brambles, however, may be said to be more truly biennial, though even these often throw out flowering shoots from the old barren stem a third year. The vestiture of the barren shoot of the year, towards its base, offers the best guide to the sectional position of the plant.

* Secondary axillary rooting shoots are occasionally thrown off from the barren stem, and even from the branches of the flowering panicle.

I shall now briefly characterize those forms of British Rubi that did not come under my notice in the Malvern district.

Subdiv. i. RUBI CÆSII.

R. Salteri, Bab. "Stem angled slightly hairy, prickles small, leaflets elliptic acute, panicle compound."—*Bell.-Salt*.

I am not acquainted with this bramble, except from a dubious Cheshire specimen, sent me by the late Mr. S. E. Wilson, which seems much like my *R. sublustris*; and it is placed by Dr. Bell-Salter himself next to *corylifolius*. It is said, however, to spread abundantly by creeping stolons, which has hitherto been only observed of the Idæan Rubi. It is stated to be "rare,"—its head-quarters the Isle of Wight. With this, Dr. Bell-Salter has placed the following, as a variety; but, until better known, it may be advisable to describe it separately.

R. Balfourianus, Blox. Stem round or obtusely angular, clothed with short, spreading, and accumbent hairs; prickles irregularly scattered, small, but strong and sharp; petioles hairy; leaves quinate, very large, hairy above, densely pubescent beneath; basal leaflets subsessile, and slightly overlapping, central one cordate-ovate, dilated, and often lobed, cuspidate, dentate-apiculate; rachis hairy; panicle very broad, diffuse, hairy, and setose; flowers on long setose pedicels; sepals broad, woolly, and setose, loosely investing the fruit. In hedges, rare.

This is a luxuriantly-developed bramble, distinguished by its very large pubescent foliage, pale, but not white, beneath; diffused, branched panicle; and broad, woolly, setose calyces, loosely investing the fruit. If really a state of *R. Salteri*, it is another instance of the manner in which varieties sport into a monstrous appearance from their normal forms, as shown in the common state of *amplificatus*, with respect to *R. Schlechtendahlii*, and several others. In this, and many gigantic Rubi, I have noticed that the stem often remains suberect instead of arching, and, in this case, thickens at the top, becoming very hairy there, and surrounded with a mass of dense, small prickles. From the thickened part several other barren shoots branch off, or the secondary shoots thicken in their turn, producing tertiary shoots; till the whole mass bends in some degree, or gets supported, the main stem still remaining upright. From these suberect stems, luxuriant flowering shoots proceed, often with monstrous, very compound panicles. *R. Balfourianus* has been but rarely observed. My friend the Rev. Andrew Bloxam gathered it near Rugby, Warwickshire. I

have myself noticed some quantity of it in a lane leading from Castle Bar, near Ealing, to Twyford, Middlesex.

Subdiv. ii. RUBI GLANDULOSI.

R. Guntheri, Weihe, β . *thyrsiflorus*. Stem angular, sulcate, with small unequal prickles, and many setæ, and pale aciculi; leaves quinate, hairy; panicle very long, flexuose, with distant, axillary, racemose, somewhat spreading branches, the upper ones densely crowded, and overtopping the central flower; peduncles and calyces weakly armed, but covered with spreading hairs, extending beyond the very numerous setæ. In upland thickets, rare. Between Ilfracombe and Hele, Devonshire. Monmouthshire, *Mr. Babington*.

This thyrsifloral variety of *R. Guntheri* is a magnificent bramble, and seems of rare occurrence in this country. It has a very rough appearance, and, with its spreading, clustered branches, presents a striking difference to the pyramidal form of *R. Menkii*, though its panicle is equally long. I described this variety as *R. thyrsiflorus* in Steele's 'Handbook' (1847), but am now convinced it belongs to *R. Guntheri*. The latter, though local, has an extensive range, as I have gathered it in Devon, and received it from Hebden Bridge, Yorkshire. It is found, also, in Leicestershire, Warwickshire, and Worcestershire. Herts, *Rev. W. H. Coleman*.

R. Menkii, W. & N. Stem prostrate, angular, closely covered with few, spreading hairs, many setæ, and short aciculi; the prickles distant, slender, unequal; leaves mostly ternate, with scattered, acuminate hairs above, paler, with ciliated ribs, beneath; the central leaflet obovate, acuminate, sharply serrate; rachis densely hairy, concealing the aciculi and setæ; panicle racemose, leafy, gray with weak, entangled hairs, among which are numerous purple setæ, and a few weak, deflexed prickles; the lower axillary branches distant, rising almost parallel with the stem, upper ones crowded, spreading, single-flowered; peduncles and bracts covered with long hairs, setæ, and weak prickles; sepals excessively hairy and setose, patent in flower, and investing the half-ripe fruit.

β . *pyramidalis* (*R. pyramidalis*, *Bab.*). Panicle very long, leafy almost to the summit; the lower axillary branches so elongated as to be mixed up with those above them, and all in close conjunction with the main stem, and parallel with it.

This species seems hitherto to have been misunderstood, and consequently unnoted; but it is undoubtedly connected, by intermediate links, with *Mr. Babington's* "*pyramidalis*," as I have observed both

in Wales and Worcestershire. The name of the German botanists must therefore take precedence. *R. Menkii* appears to be almost peculiar to forest districts, where the barren stem is mostly prostrate upon the ground. If it thus remains concealed in the shade, the panicles of the next year are short, displayed in a fastigate manner, and of a very cinereous aspect; but, when more exposed, the panicle is long and racemose, exactly as represented in *Rub. Germ. t. xxii.* The leaves, though generally ternate, are sometimes quinate; but, in that case, the basal pair are of small size, and seated on the stalks of the intermediate. From the edges of the leaflets being decurved, they appear almost plane and even, though, in reality, sharply serrate. The barren stem, when exposed, is finely tinged with purple, and the prickles numerous, unequal, but weak and slender, straight or slightly declining, and of an intensely bright purple colour. The calyces are very hairy; when exposed, beautifully covered with purple prickles and setæ, and, before expanding, rosaceous, with leafy points. They are involute upon the half-ripe fruit, but at length loosely reflex. The variety agrees in all respects with the type, but has a remarkably elongated, pyramidal panicle, whose long-stalked branches, almost parallel with the stem, and purple-cinereous aspect, distinguish it from every other bramble.

In subalpine woods and moist thickets, but rather uncommon. Banks of the Lyn, near Brendon, Devon. Shrawley Wood and Wyre Forest, Worcestershire. Capel Curig, Caernarvonshire. The var. *β.* with the type, and also at Llanberis, Caernarvonshire. Also at Culbone, Somerset, *Mr. Babington.*

R. Babingtonii, Bell-Salt. Stem angular, sulcate; prickles small, compressed; aciculi many; setæ few, scattered; leaves ternate or quinate, large, pilose beneath, their leaflets coarsely dentate, terminal one broad, obovate, abruptly cuspidate; rachis setose, not tomentose; panicle long, leafy, setose, with slender prickles; branches short, ascending, crowded at the summit; sepals hairy, setose, acuminate, patent in flower.

β. Bloxamii (Lees). Stem sulcate, with numerous setæ and aciculi; leaves quinate, soft, and green, hairy on both sides; rachis very hairy and setose; panicle very long; the lower branches distant, paniculate, leafy to the suddenly crowded, short, bracteated upper ones; the peduncles densely hairy and setose, closely armed with long pale prickles. Borders of woods.

The variety with which I am best acquainted is a very savage-looking bramble, more prickly than the type; and on the barren stem

the setæ, aciculi, and prickles pass insensibly into each other. The rachis is covered with long hairs, almost concealing the setæ and aciculi, and densely armed with long pale prickles. Panicle, in full luxuriance, two or three feet long, with very distant, axillary, paniculate branches, at first ascending at a very acute angle; the ternate floral leaves rising nearly to the summit; upper branches densely crowded together, with trifid bracts, amidst a confused mass of hairs, aciculi, and long pale prickles; sepals foliaceous, covered with long white hairs and setæ, finally reflex. The very distant lower corymbose branches of the panicle in *Bloxamii*, and its far more rigid, thorny aspect, distinguish this from the *thyrsiflorus* form of *R. Guntheri*. On the borders of woods, but rare. The type in Hants, Leicestershire, Herefordshire, and Caernarvonshire; β . in Middlesex, Warwickshire, Leicestershire, and Staffordshire.

R. hirtus, W. & N., var. *horridus*. Hairs on the panicle so long as to be both spreading and accumbent, exceeding the setæ and aciculi in length, forming dense masses at the origin of the axillary branches; sepals armed with long, white, slender prickles, rising beyond the crowded hairs and setæ, ending in foliaceous points. Forest districts.

I must here remark that the common form of "*hirtus*," as named in English herbaria, and distributed in Leighton's '*Fasciculus*,' is very unlike the figure of *hirtus* in *Rub. Germ.* xliii., more approximating, in the appearance of its barren stem, to *rosaceus*, t. xxxvi.; while the variety I have indicated quite agrees with the armature of the panicle in that figure, and even with its rosaceous, leafy calyces.

R. scaber, Weihe., β . *verrucosus*. Stem densely armed with yellow prickles, whose bases are distended into each other, stiff with hairs and innumerable setæ; panicle with numerous axillary branches, nutant in fruit; peduncles and sepals densely hairy and setose, crowded with acute, falcate prickles. Subalpine thickets. Bromsgrove Lickey, Worcestershire.

This variety is more closely and densely armed than any other British bramble I have met with, the enormously-distended bases of the prickles having setæ even upon them, and the entire panicle excessively thorny. *R. scaber* itself is confined to exposed, hilly spots, as Horsenton Hill, Middlesex; the Old Storage Hill, Leigh Sinton, Herefordshire; Sutton Park, Warwickshire; and in Leicestershire. I observed it, a few years since, in some abundance near Aber, Caernarvonshire. Its red, very prickly stem will always distinguish it.

R. humifusus, W. & N. Stem procumbent, sulcate, covered with numerous, but very slender and elongated, setæ, aciculi, and prickles; leaves ternate or quinate, glaucous, but closely pubescent, beneath; leaflets obovate, acuminate, sharply serrate; panicle narrow, with short, axillary, lower branches, densely crowded at the summit, very hairy and setose, armed with excessively slender prickles; sepals elongated, densely setose and hairy, closely armed with slender prickles. In thick woods, rare. Hartshill, Warwickshire; and in the forest of Dean, Gloucestershire. Near Caernarvon, and in Baron-hill Woods, Anglesea.

A prostrate bramble, the flowering stems rising from the ground, with a foliose aspect, and glaucous-green colour. The prickles, both of the stem and panicle, are long and sharp, slender as needles, and quite peculiar. This is referred as var. *foliosus* to *hirtus*, by Mr. Babington; but I here coincide with Dr. Bell-Salter.

R. mucronatus, Blox. Stem obtusely angular, slightly hairy, with a few scattered, inconspicuous setæ, and few, distant, straight prickles; leaves ternate and quinate, large, thin, and green on both sides, hairy on the veins beneath; central leaflet broadly obovate, abruptly cuspidate; panicle lax, wavy, leafy below, spreading towards the summit, covered with long hairs and pale, weak, setæ; the uppermost flowers on long, hairy, setose peduncles, armed with very long weak prickles. Shady thickets, rare. Twycross, Leicestershire; Hartshill, Warwickshire; also in Shropshire, according to Leighton's 'Fasciculus.'

This is one of those anomalous forms that it is difficult to place correctly without some study and observation. Mr. Leighton has distributed it, in his Fascic. of Rubi, as "*R. sylvaticus*;" and Mr. Bloxam, in his account of the Leicestershire Rubi, considers it a *hairy* bramble, with the above name. My observant friend, however, sent it to me originally as *R. lingua*, W. & N.; and I described it under that appellation in Steele's 'Handbook' (1847). It appears to me to be clearly a *glandular* bramble, green, weak, and attenuated, from growing in the shade. Its upper single flowers, rising above the central one, on hairy pedicels, covered with long pale setæ, and still more elongated needle-like prickles, give it often a remarkable appearance; but, when less developed, the panicle is flexuose and racemose, as in *R. Guntheri*. The setose sepals become inflex about the half-ripe fruit, but are finally loosely reflex. In this last particular, they agree with *R. Menkii* as well as in the *ashy tomentum*, mentioned by Mr. Bloxam as clothing the rachis.

Subdiv. iii. RUBI VILLOSI.

R. calvatus, Blox. Stem angular, sulcate, with few, spreading hairs (quite denuded in the upper part); prickles many, declining, irregularly scattered; leaves quinate, with hairy petioles, green on both sides, almost bald, the ribs and veins beneath only inconspicuously ciliated; leaflets all stalked, the basal pair retrose, terminal one ovate, cordate at the base, sharply and deeply apiculate, dentate, acuminate; rachis deeply ribbed, clothed with stiff, spreading hairs; panicle long, flexuous, with many corymbose branches, gradually shortening and leafy nearly to the summit; peduncles densely hairy, closely armed with long pale prickles; sepals tomentose, loosely reflexed. In exposed thickets, but not very general. Near Twycross, Leicestershire; and found by the Rev. Andrew Bloxam in several parts of that county, and in Warwickshire. Precisely similar specimens the late Mr. R. E. Wilson sent me from Cheshire. Also near Ilfracombe, Devonshire.

A large, remarkably savage-looking and strong bramble, whose stem becomes quite denuded; and the leaves are singularly bare, a few scattered hairs only being scarcely discernible on the veins and ribs beneath. The central leaflet is often exactly ovate, and very regularly, but deeply, apiculate-dentate, gradually acuminate; panicle very long, with rough, hairy, and closely prickly branches, leafy throughout, and frequently widely divaricated at the summit. This was formerly confounded with *R. villicaulis*, W. & N.; but the latter has its barren stem densely covered with white hairs, its leaves tomentose, and the branches of its panicle mostly ultra-axillary. It is not uncommon in woody spots. Plentiful in Caernarvonshire, and southward to Dorsetshire.

Subdiv. iv. RUBI PILOSI.

R. Sprengelii, W. & N. Stem prostrate, round, clothed with long spreading hairs; prickles small, weak, hooked or deflexed, and dispersed unequally on all sides; leaves mostly ternate, thin, smooth above and beneath; leaflets elliptical, central one obovate, sharply serrate, acuminate, with prominent veins beneath; panicle slender, with crowded, divaricate, leafy branches; the peduncles closely covered with attenuated, tortuous hairs, concealing both setæ and prickles; petals small, obtuse, and rugose. In thick woods, rather local. I have gathered it in Buckinghamshire, Devonshire, Gloucestershire (forest of Dean), Leicestershire, Warwickshire, and

on Bromsgrove Lickey, Worcestershire. Also by the side of Llyn Cwellyn, and near Capel Curig, Caernarvonshire. Mr. Samuel Gibson sent it me from Hebden Bridge, Yorkshire, unnamed, nearly ten years since; and Mr. S. E. Wilson, from Cheshire.

Perhaps the most beautiful of the British Rubi, delighting in shady upland woods, often among the *Vaccinium Myrtillus*, where the barren stem trails upon the ground, throwing up numerous alternate flowering shoots, densely covered with weak, but long and spreading, white hairs; yet the plant is scarcely evident to the view until the small, but very deep red, flowers are unfolded. The prickles are always small, not quite uniform in size, pale yellow, and often very uncinatè. The panicle is very hairy, with distant, leafy, cymose branches below, single-flowered, with narrow, leafy bracts, above; peduncles clothed with long extending hairs, partly spreading, partly accumbent, and entangled among which are a few slender, pale prickles. Sometimes the panicle is excessively complicated, the branches themselves becoming doubly cymose, and the central flower overtopped. The sepals are elongated, densely hairy, partially investing the half-ripe fruit, but at length loosely reflex; petals small, rugose, bright red, or, more rarely, white; fruit small, of few drupes, deep purplish black.

β. *Borreri* (R. Borreri, *Bell-Salt.*). Stem stouter, with larger and more unequal prickles, and a few setæ and aciculi. Leaves generally quinate; panicle corymbose, prickly; the widely spreading branches with setæ far overtopped by the wavy hairs. Growing in more exposed places than the type, and so forming taller and more luxuriant bushes; but intermediate connecting forms occur. Warwickshire, Cheshire, &c. I observed it very fine, a few years since, at Burnham Beeches, Buckinghamshire.

R. macrophyllus, W. & N. In mentioning this species in a general account of Rubi, I would still further indicate its distinctness from my *R. amplificatus*, with which it is so generally confounded. The latter common form is certainly not the German plant of Rub. Germ. t. xii., the one now in review, and which I believe to be the real plant of the Sussex forests, where I have studied it. *R. macrophyllus* has its barren stem very thick, yet pithy, not ligneous, deeply sulcate, and surrounded with a fringe of patent hairs; the prickles very distant, few, and exceedingly small in proportion to the size of the shrub. The stem, in moist places, extends widely, and arches, but grows in a suberect manner when confined. In the latter case, it is often densely hairy; while, when more exposed, there is merely a fringe of

patent hairs. The leaves are ternate, as well as quinate, but mostly the latter, not always very large; but the leaflets have *a peculiar white tomentum beneath*,* that distinguishes them from *R. amplificatus*; the intermediate and terminal leaflets being nearly of the same size, but with a wavy, irregular outline, and very coarse serratures. The large panicle appears often almost unarmed; and, if the branches are short, the floral leaves rise far above them; but in full luxuriance it is long, with wide-spreading, leafy branches, densely hairy, and with numerous pale, weak prickles; glands being often concealed amidst the spreading hairs. The lower axillary branches have large, ternate floral leaves (also with a pallid silvery aspect beneath), which are much reduced in size upon the ascending ones; so that near the summit of the panicle they are quite lanceolate; but the uppermost branches are naked. Calyces reflex in flower and fruit, their sepals densely hairy, sometimes prickly; the fruit round, very small, of few drupes, and of an intensely polished black. In woods and forest thickets, rare. Chiefly in the South of England. St. Leonard's Forest, Sussex; and at "The Shorden," a wood near Hastings. Near Ilfracombe, Devon; and in Cowleigh Park, near Cradley, Herefordshire. Also in Glamorganshire, and by the lower Llanberis Lake, Caernarvonshire. (The specimen distributed in Leighton's Fascic. of Rubi as "*R. macrophyllus*" is only *R. amplificatus*).

Subdiv. v. RUBI CANDICANTES.

R. thyrsoides, Wimm. Stem sulcate, almost glabrous, with very few fascicled hairs; prickles numerous, strong; leaves quinate, smooth above, silvery pubescent beneath; the leaflets all stalked, middle and basal elliptical, central one oblong, all very sharply serrate, cuspidate; panicle long, thyrsoid, with numerous axillary branches, distant below, gradually shorter and very crowded at the summit; peduncles shaggy with hairs, armed with falcate prickles; calyces tomentose, tawny, loosely reflex in fruit. Hedges and thickets, but not common.

β. macroacanthus. Stem and petioles densely armed with falcate prickles; rachis covered with stiff hairs; panicle pyramidal, with numerous, many-flowered, corymbose branches, gradually shortening to the summit; peduncles, calyces, and under side of leaves white, with a thick investiture of stiff white hairs.

* "Foliola," observe W. & N., in their detailed description of *R. macrophyllus*, "in latere superiori saturate viridia parum pilosa, in latere inferiori sub-tomentosa, pallide viridia, coriacea."—*Rub. Germ.* p. 35.

The plants of this section are all closely related to each other; and some states of *macroacanthus* are, with difficulty, distinguishable from *R. vestitus*.

Subdiv. vi. RUBI NITIDI.

R. cordifolius, W. & N. (and *R. rhamnifolius*). This very common, and generally well-marked bramble, has its leaves extremely variable, both in size and outline; but frequently they are exactly heart-shaped; and therefore I think the name *cordifolius* is to be preferred. The central leaflet, in woods, is often thrown out on a singularly elongated foot-stalk; but this is a mere sport of growth: and occasionally the leaflets are cut up into lacinated, pinnatifid segments. I can see no essential distinction in Mr. Hort's *R. imbricatus*, described in the third edition of Babington's Manual, as intermediate forms occur; nor can a species be well founded merely upon the disposition of the leaflets. I noticed, in Steele's 'Handbook,' var. β . *blanditus*, which is the thyrsifloral form of this species, with long leafy panicle, and leaves very large and velvety beneath. There is also a wood form, which may be termed *olivaceus*, from its dull olive-green aspect. This is more prickly than the type, the leaflets closer together, somewhat imbricate, obovate and acuminate, with a narrower and more prickly panicle.

R. affinis, W. & N., β . *patentissimus*. Panicle with wide-spreading, compound, naked branches; leaflets obovate or ovate-oblong, with long, curved cusps, beneath strongly ribbed and pubescent. In woods.

This bramble, long misunderstood, proves to be widely dispersed in its typical form, and affects exposed heaths, where it forms stunted bushes, with a suberect habit. I have observed it in great plenty in Cardigan and Caernarvon shires; and probably few counties are without it. In woods, it grows taller, with long and often widely-distended panicles; but the fruit is then mostly abortive.

R. lentiginosus, Lees. Stem suberect, clothed with rather distant, patent hairs, and numerous sessile glands (in age denuded), armed on all sides with sharp, straight, slightly unequal prickles; petioles hairy, with many falcate prickles; leaves quinate; the basal leaflets sessile and retrorse, intermediate elliptical, central one ovate, all inciso-serrate, acuminate, smooth above, hairy on the ribs beneath; panicle long, racemose, with short axillary branches, hairy and very prickly, with inconspicuous glands, leafy nearly to the summit; bracts hairy and slightly glandular; sepals densely hairy and prickly, with

interspersed glands, involute on the half-ripe fruit ; petals small, crumpled, not exceeding the calyx in length. Subalpine woods. On the woody ascent at the back of the hotel at Capel Curig. On the side of the ravine below Conant Mawr, Caernarvonshire.

This is a very prickly bramble, with a suberect habit, the stem sometimes marked with blotches ; and its nearest relationship appears to be with *R. affinis* ; but its elliptical, sharply-cut leaflets, and racemose panicle, give it a very different appearance to either that or the suberect *Rubi* ; and it is rather comparable to *R. Guntheri*, among the glandular group. The flowers are in general small, and the whole plant weak ; yet the stem is so prickly, and the points of the prickles so sharp and attenuated, that it is one of the most lacerating among the whole tribe. It seems attached to subalpine spots, where only I have found it, and does not fruit well, except on moist ground.

The stem appears to be constantly suberect, but bent to the ground with the flowering shoots, which mostly rise up in a fastigiate manner ; leaves sometimes septenate ; the rachis is clothed with spreading hairs ; the panicle flexuose, variable in length, in full luxuriance long, with many alternating axillary racemes of small flowers ; floral leaves ternate ; the uppermost branches clustered, single-flowered, naked ; peduncles and bracts covered with long spreading hairs, with a few glands on the latter ; calyces closely hairy and prickly, with glands hidden in the pubescence ; the sepals patent in flower, and until the fruit is half ripe, then becoming loosely reflex ; petals very small, crumpled, inflex, scarcely exceeding the sepals in length ; stamina and styles pale green ; fruit, in a half-ripe state, a brilliant red, but finally intensely-polished black, oblong and irregular, of many drupes. Ripe in September.

Subdiv. vii. RUBI SUBERECTI.

R. suberectus, And. Stem angular, polished, smooth ; prickles distant, straight ; leaves ternate, quinate, or septenate, flexible, with prominent veins beneath ; central leaflet cordate, acuminate, often very elongate ; panicle almost simple (when the stem trails on the ground), or long, with leafy, corymbose branches ; the upper flowers erect, on hairy pedicels, overtopping the central one ; sepals hairy, patent about the half-ripe fruit. Subalpine woods and boggy heaths.

β. fissus (*R. fissus*, *Lind.*). Prickles numerous, very slender ; leaves more hairy ; basal leaflets sessile, or united with the intermediate, central one divided at the base ; panicle short, crowded.

γ. umbrosus. Stem firm and lofty ; leaves very large ; the central

leaflet broadly cordate, excessively elongated at the point; panicle short, with single flowers, and large floral leaves.

Except as regards the barren stem never rooting at its extremity, *R. suberectus*, according to situation or exposure, is a very variable plant. It only attains perfection in moist, shady places; and where moisture is wanting, though at first erect, the weak, barren shoot trails upon the ground, or rests upon the low underwood, producing numerous, but short, fastigate bunches of flowers from the axils of the old leaves. This is a form of growth, but can hardly be distinguished as a variety, and is represented in *Rub. Germ. t. 2*. When the stem preserves its erect form the second year, the panicle is moderately long, with leafy, corymbose branches, below more or less hairy, almost unarmed; the uppermost flowers single, alternate, on long bracteated pedicels, overtopping the central flower. It is remarkable that, in their progress towards fruiting, the upper flowers spread out in an horizontal direction; so that when the fruit is mature they present a far more fascicled aspect than they did originally. Conspicuous, trifid, hairy bracts occur at their bases, becoming simple at the summit; the calyces are hairy, patent even in fruit, seldom more than semireflex; petals white or pink, of a pretty appearance when fully expanded; the fruit is rather small, its drupes few, and often presenting only dry, hard achenes, when half ripe of a bright red colour, but, when succulent, mulberry-coloured, or at length raven-black.

It is only in the woods near the waterfalls of Wales, or on the moist, bushy hills of Devonshire, that this species attains its perfection of beauty, growing perfectly erect, producing conspicuous flowers, and, in the var. *umbrosus*, becoming an ornamental shrub, from six to eight feet high. The leaves are frequently very large, bright green, and of a soft, silky appearance; but the fruit is seldom succulent but in moist, shady localities, and has but little flavour.

Though generally accounted rare, this species has a wide range, and, though perhaps more abundant in the North, grows finer and most luxuriant in the South of England. Don mentions it as growing on the banks of Loch Ness, Scotland, and as a native of the Highlands of Aberdeen and Perthshire, and the hills of Forfarshire. I have gathered it in Devonshire, Somersetshire, Buckinghamshire, Gloucester, Leicester, Warwick, and Worcester. I have also received it from the Lake district, Yorkshire, and Cheshire. It is most abundant in North Wales, particularly in Caernarvon, Montgomery, and

Merioneth shires ; and I have gathered it, also, in Brecon, Cardigan, Pembroke, Caermarthen, and Glamorgan shires.

R. plicatus is equally extended with *R. suberectus*, and is a stronger and stouter plant, with larger prickles. It is less commonly found prostrate, but is occasionally forced to the ground, beneath the weight of its flowering branches. I have observed it very fine on the Island of Llandysilio, in the Menai Strait.

Subdiv. viii. RUBI IDÆI.

R. Leesii, Bab. Stem round, bending, closely, but minutely, tomentose ; prickles numerous, slender, straight, rising suddenly from a bulbose base ; leaves all ternate ; the leaflets subsessile, roundly ovate, the basal ones overlapping, minutely hairy above, white, with accumbent pubescence beneath ; flowering branches axillary, alternate to the end of the stem, downy, with trilobated or cordate, deeply-cut floral-leaves ; flowers in numerous clusters ; the peduncles armed with setaceous prickles. In stony, subalpine woods, rare. Ilford Bridges, near Brendon, Devon. Dunster, Somerset, on the way to Timberscombe.

Stem scarcely a yard in height, producing terminal as well as axillary flowers, in dense clusters, and well characterized by the singular, trilobated, widely-distended floral leaves, which are frequently so united as to be cordate, and deeply indented. The petals are often multiplied in number to twelve or sixteen, which is probably the reason the plant seldom fruits. I have only once met with it in that state, when the fruit was very small, and bright crimson.

I sent sterile specimens to the London Botanical Society nine years ago, under the name of *Fragaria-similis* ; many of the leaves having much the appearance of those of the common strawberry. It has since been gathered at Dunster, by the Rev. W. H. Coleman and Mr. Babington. It is likely to be met with in Wales and the Lake district.

To give a full and correct account of the distribution of the Rubi in Britain, would require an extended observation of many years ;* and though I have attended much to the subject, I know but little of the Rubi of the North of England, from actual observation. A lover

* Mr. Babington has a valuable paper on the subject, in the third volume of Mr. Watson's 'Cybele' ; but I could much extend the range there given for many species.

of temperate regions, the bramble does not, in this country, rise very high on the mountains, and is most luxuriant in the valleys, especially in the vicinity of moisture; though *R. discolor* will flourish in the driest spot. The loftiest place on which I have found a bramble growing is on the tabular summit of the Banwen Mountain, Breconshire, about 1800 feet in altitude, where I have gathered *R. suberectus* in a stunted state, yet with large, disproportionate flowers, very similar to specimens I have from the "Highlands of Scotland," presented me, some years since, by Mr. H. C. Watson, but with no mention of altitude. Perhaps in Scotland, *R. suberectus*, in springy spots upon the mountains, may ascend higher than in Wales. The highest spot where I have noticed *R. cæsius* is on the table-land of the Cotteswolds, near Birdleap, Gloucestershire, which is between 1000 and 1100 feet high. Next to *R. suberectus*, the pretty *R. Sprengelii* seems most to affect subalpine spots: it occurs on the summit of the Lickey Beacon, Worcestershire, among bilberries, at 950 feet; on Bardon Hill, Leicestershire, at 800 feet; and between Capel Curig and Llanrwst, North Wales, which must be considerably higher. *R. Bellardi*, also, I have noticed, on a wooded hill near Malvern, at full 800 feet; and many of the Rubi that occur about waterfalls in Wales, as *R. Menkii*, *R. scaber*, *R. incurvatus*, *R. affinis*, &c., must be seated at full 1000 feet; but brambles are never found, with the *Ulex*, occupying the summit of mountains. Indeed, it is in the southern counties where they attain the greatest luxuriance of growth, especially in Devonshire, where *R. macrophyllus*, *R. plicatus*, and *R. suberectus* grow very lofty, with magnificent foliage, and *R. Guntheri* is dilated into the thyrsofloral form.

The bramble tribe flourish, on the coast, to the very margin of the sea. Extensive sandy tracts in Merioneth and Caernarvonshire are covered with the trailing *R. cæsius*; and my friend the Rev. J. H. Thompson has observed the same in Lincolnshire. Probably the coast of every English county where there are sandy denes possesses the cæsian bramble in like manner. *R. discolor*, also, extends to the tidal boundary, and where I have seen it on the shores of North and South Wales, and in Devon and Somerset, must often be bathed in the saline spray.

R. cæsius, *corylifolius*, and *discolor* appear to be very generally dispersed; but the latter becomes less common in the north of England. The glandulose brambles have some form to represent them almost everywhere in the low country, of which *R. rudis* and *Kœhleri*

are the most certain and characteristic. *R. hirtus* and *R. pallidus*, though equally common, are confined to woods. *R. Bellardi* and *Lejeunii* ("glandulosus," *Bab.*) are local species, yet widely dispersed from Yorkshire to Middlesex. They occur in several places in the intermediate counties, as Leicester, Hereford, Worcester, and Bucks. I have also gathered *R. Bellardi* near Dolgelley, Merionethshire. The very prickly *R. scaber* affects hilly woods, as Horsenton Hill, near Harrow, Middlesex, and Bromsgrove Lickey, Worcestershire. It also forms thickets about the bases of the mountains in Caernarvonshire.

R. carpinifolius and *cordifolius* are of general occurrence; and scarcely any wood is devoid of *R. amplificatus*; but what I conceive to be the true *R. macrophyllus*, *W. & N.*, is rare, except in the south of England. *R. villicaulis* abounds in North Wales, but is by no means a general hedge-bramble; and *R. vestitus* is universally diffused in woods, becoming excessively villose in the shade. *R. Lindleianus* (*R. nitidus*, *Bell-Salt.*) is a common form, particularly abundant in North Wales and Anglesea; nor is *R. affinis* much less diffused, as I have either gathered or received it from various counties, from Westmoreland to Dorset.

In Wales, a microphyllous form of *R. Idæus* is prevalent in subalpine spots; but though the foliage of this is often ternate, the leaflets are never ovate and overlapping, as in the very local *R. Leesii*. The common state of *R. Idæus*, from its stoloniferous growth, is almost everywhere widely spread, and continually extending itself.

R. saxatilis is well known as a northern herbaceous species; but I have gathered it as far south as Watersmeet, on the banks of the Lyn, Devonshire. It occurs, also, in Wire Forest, Salop, and Worcester; and is quite abundant among the stony recesses of the woods of the Cotteswolds, Gloucestershire.

EDWIN LEES.

Cedar Terrace, Henwick, Worcester,
March 9, 1853.

Remarks on Plants sent to the Botanical Society of London in 1852.

By J. T. SYME, Esq.*

As the additions to the British Flora in 1852 have been but few, my report on the plants sent to the Botanical Society of London will be short, although the number of specimens received has been very large. Most of these, of course, require no explanation; and there are only a few varieties and doubtful species which seem to call for special notice. These will be sent out as usual, as far as the supply will admit of, and include the following:—

1. *Thalictrum pubescens*, Schl. A pubescent variety of *T. minus*, from Redcar. Communicated by Mr. J. G. Baker.

2. *Ranunculus aquatilis*, L., var. ? I send this, as it is sometimes mistaken for *R. fluitans*, which it somewhat resembles in the elongated stems, destitute of floating leaves; rounded carpels; and many-veined petals. The specimens are from the side of the Thames, near Putney.

3. *Ranunculus confusus*, Gr. & G. Mr. Baker sends what seems to be a very slender form of this plant, with the leaves, flowers, and carpels less than half the usual size.

4. *Barbarea vulgaris*, Br. Variety with spreading pods. Sent as it might be confounded with *B. arcuata*.

5. *Nasturtium officinale*, Br., var. *Sisifolium*, Rchb. A very luxuriant state of *N. officinale*, from Haddingtonshire.

6. *Melilotus parviflora*, Lam. Abundant on rubbish on a new quay at Wandsworth, with many other aliens.

7. *Epilobium Lamyi*, F. Schultz. Mr. T. Moore sends the plant, found by him near Sandwich, which was so named by Mr. Babington. Mr. Purchas sends the same form from Herefordshire, under the name of *E. virgatum*, Fr. This name, however, I think, belongs to another plant, of which I distribute a few examples from Scotland.

8. *Montia rivularis*, Gmel. A large form of *M. fontana*, L., considered as a distinct species by some continental botanists.

9. *Hieracium cæsium*, Fr. From Yorkshire (Mr. Baker). Probably some members may have this in their herbaria under the name of *H. murorum*, which seems to be a more uncommon plant in Britain.

10. *Carduus acaulis*, L. Var. with a distinct stem. The examples are from Kent and the Isle of Wight.

* Read before the Botanical Society of London, April 1, 1853.

11. *Chenopodium rubrum*, L., var. Resembles *C. botryoides* by its prostrate stem and entire leaves. The seeds are larger than in the ordinary form. Gathered by the side of the Thames, below Gravesend.

12. *Narcissus incomparabilis*, Curt. Kilvington, Yorkshire, where it was found by Mr. Baker; quite naturalized.

13. *Glyceria hybrida*, Tourn. A variety of *G. plicata*, so labelled by Mr. Baker.

14. *Bromus secalinus*, L., var. A very puzzling form, from Hook, Surrey, sent by Mr. Watson. It is intermediate between *B. secalinus* and *B. commutatus*. I should have rather labelled it as the latter.

15. *Bromus patulus*, M. & K. ? From Middlesbro', Durham (Mr. Baker). Very like *B. arvensis*; but I have not altered the name, as I have never seen *B. patulus*; and this plant has some of the characters assigned to that species.

Mr. Watson sends *Hieracium gothicum*, Fr., from Surrey; and Mr. Baker, *H. tridentatum*, Fr., from Yorkshire. These two plants certainly belong to the same species, as Mr. Watson pointed out to me. Mr. Atkins also sends it from Kent, under the name of *H. sylvaticum*.

Poa polynoda, Parn., has been sent by several members, under the name of *P. compressa*, from which I have great difficulty in distinguishing it, even as a variety.

Of *Triticum laxum*, Fr., there is a large supply, from Mr. T. Moore and myself. Some of my specimens I am at a loss whether to label as *T. laxum*, or *T. repens*, β . *littorale*.

Thalictrum flexuosum, Fr. Specimens of what I suppose to be this plant have been received from the Rev. T. Butler and Mr. Whittaker. The former sends it from Snowdon; the latter, from Disseth, Flint.

Mr. Whittaker also contributes a number of specimens of *Thlaspi virens*, Jord., from Matlock. Since my last report, I have received specimens of this plant from Lyons, named by Mr. Jordan. These agree pretty well with the Derbyshire plant in the shape of the pouch, and length of the style, but have the fruiting raceme shorter, and the flowers nearly twice as large.

I am glad to notice considerable improvement in the selection of specimens sent to the Society, and hope that before long the practice of sending useless scraps may be given up altogether. The grasses, Cyperaceæ, Orchideæ, and bulbous Monocotyledons suffer most from the habit of sending examples without roots; and roots are of the

greatest importance in these very orders. In the two first orders, indeed, specimens should always show whether the plant has a creeping or a tufted root; yet some of these, which are beautifully pressed, are quite useless, from being without roots, and some even without leaves. I hope, however, that this may be remedied, by destroying all the imperfect specimens, except in the case of very scarce plants.

J. T. SYME.

London, April, 1853.

NOTICES OF NEW BOOKS, &c.

‘*A Catalogue of the Flowering Plants and Ferns growing in the Neighbourhood of Aberdeen.* By P. H. MACGILLIVRAY, A.M.’
Aberdeen: Wilson. London: Whittaker. 1853.

ALL local Floras are acceptable to the botanist, in proportion to the information they convey. Thus, a simple list of names is of infinitely less service than when each name is accompanied by some account of the circumstances under which the species to which it refers is found. In this respect, we think the information afforded by the present Flora is rather scanty. We could have willingly dispensed with some of the information given, and should have been pleased to have received other information which is withheld. Thus, we are informed that *Ranunculus aquatilis* occurs in “ponds, ditches, and rivers,” and *R. hederaceus* in “ditches.” We doubt not these assertions; but we should have liked some additional information on the supposed new and kindred species, all notice of which is omitted. Again, in the ferns, we scarcely feel satisfied with the old-fashioned mode of lumping species. However, in this and all similar cases, we think the more courteous way is to give the author’s own “envoi;” and here is Mr. Macgillivray’s

“*Preface.*—The only published accounts we have of the botanical productions of the neighbourhood of Aberdeen are contained in Dr. Murray’s ‘Northern Flora,’ of which, however, owing to the untimely death of its talented author, but one part made its appearance; and in a small work by Dr. Dickie, giving a list of the Flowering Plants and Ferns found within fifteen miles of Aberdeen. So many years

have elapsed since the publication of Dr. Dickie's list that a very considerable number of species and localities have been added, but many doubtless still remain to reward the zeal of future collectors.

"The boundaries I have chosen are, to the north, the estuary of the Ythan; to the south, Garron Point in Kincardineshire, about twelve miles from Aberdeen; and to the west, the village of Banchory Ternan, eighteen miles from the same place. In this tract of country we have almost every diversity of soil and situation, from maritime downs and cliffs to elevated upland moors. The coast to the south of Aberdeen presents an extensive range of low rocky precipices, plentifully interspersed with coves and bays, with pebbly beaches, marshes, and grassy sea-banks; while to the north extends a bare sandy beach, lined by a narrow belt of sandy downs or links, with the estuaries of the Don and Ythan, and here and there a few small marshes. Within this, and south of the Dee* occupying a smaller space, is the usual tract of cultivated land, meadows and pastures. Further inland are extensive ranges of moory hills, and at frequent intervals scattered through the cultivated country are various moors and bogs, as well as several lakes, some of which are of large size.

"Along the sandy beach and links to the north of Aberdeen, we find the vegetation chiefly marked by the great abundance of *Ammophila arundinacea*, *Festuca rubra*, *Triticum junceum*, *Carex arenaria*, *Myosotis collina*, and *Vicia lathyroides*. Other plants occurring here are *Cakile maritima*, *Cerastium atrovirens*, *Saxifraga granulata*, *Hieracium vulgatum*, *Gentiana campestris*, *Armeria maritima*, *Plantago maritima* and *Coronopus*, *Glaux maritima*, *Salsola Kali*, *Atriplex laciniata*, *Triglochin maritimum*, *Habenaria bifolia*, *Scirpus maritimus*, *Blysmus rufus*, *Carex incurva*, *Botrychium Lunaria*, and *Equisetum variegatum*. The Kincardineshire coast, as might be expected from its rocky nature, presents some differences in its vegetation from that north of the Dee. The plants principally characterizing it are *Cochlearia officinalis*, *Silene maritima*, *Astragalus hypoglottis*, *Ligusticum Scoticum*, *Mertensia maritima*, *Juncus compressus*, *Blysmus rufus*, *Carex incurva*, *C. distans*, *C. vulpina*, and *Asplenium marinum*. Besides these, we have *Geranium sanguineum* growing in great luxuriance on rocks south from the Cove, *Vicia sylvatica*, *Erythræa linarifolia*, *Carex intermedia*, *C. extensa*, *C. muricata*, *C. hirta*, *Festuca elatior*, and *Osmunda regalis* growing on a single cliff at the Cove.

* The river Dee, in the lower part of its course, forms the boundary between the counties of Aberdeen and Kincardine.

“The cultivated tract presents little of any interest, except that several species of common occurrence in more southern districts are here entirely wanting. These are such as *Papaver Argemone* and *Senecio viscosus*. Several others, as *Scandix Pecten*, *Stachys arvensis* and *Anagallis arvensis*, though occasionally to be met with, are of very rare occurrence.

“The hilly and moorland part of the district is distinguished by the abundance of *Drosera rotundifolia*, *Comarum palustre*, *Menyanthes trifoliata*, *Pinguicula vulgaris*, *Trientalis Europæa*, *Narthecium ossifragum*, *Eriophorum angustifolium*, *Carex binervis*, *C. flava*, *C. curta*, *C. stellulata*, *Blechnum boreale*, and *Lycopodium clavatum*. We also find, though in less abundance, *Drosera Anglica*, *Genista Anglica*, *Vaccinium Vitis-idæa*, *Arctostaphylos Uva-ursi*, *Listera cordata*, *Schœnus nigricans*, *Lycopodium alpinum*, and *L. clavatum*. In the fir woods in this tract, as well as in those scattered through the cultivated country, *Goodyera repens* occurs in considerable abundance, and in many localities may be seen the rare and beautiful *Linnæa borealis*.

“Several alpine species are mentioned as occurring on the banks of the Dee. These, however, are not to be considered as properly belonging to our Flora, but merely as accidental stragglers washed down by the river from their proper habitats among the mountains of Braemar.”

‘*The Annals and Magazine of Natural History*,’ Nos. 61, 62, 63, and 64, January, February, March, and April, 1853.

No. 61 contains one botanical article, intituled:—

‘Observations on the Solanaceæ; by John Miers, Esq., F.R.S., F.L.S.’ This paper is continued in No. 62.

No. 62 contains one botanical article, intituled:—

‘On Relative Position; including a New Arrangement of Phanerogamous Plants. Part I. On the Position of the Raphe. By B. Clarke, F.L.S., &c.’ This paper is continued in No. 63, the part therein contained (Part II.) being on the position of the carpels.

In addition, there is a translated paragraph, by G. H. Ulex, ‘On the Influence of Coal Gas on Vegetation;’ and another, by M. Garreau, ‘On the Relations between the Oxygen consumed by the Spadix of *Arum italicum* and the Heat produced by it.’

No. 63 contains one botanical article, intituled :—

‘Observations on the Genus *Schwenkia*; by John Miers, Esq.’
Also the continuation of Mr. Clarke’s paper, and an extract from the
‘Gardener’s Chronicle,’ ‘On the Structure of the Cells of Plants.’

This is a double number, containing 102 pages, and is charged 5s.

The botanical papers in No. 64 are intituled :—

‘Remarks upon British Plants; by Charles C. Babington, M.A.,
F.R.S., F.L.S., &c.’

‘On the Germination of the Resting Spores, and on a Form of the
Moving Spores in *Spirogyra*; by Dr. W. Pringsheim.’ Translated
from the ‘Flora,’ of August, 1852.

Mr. Babington’s paper is of great interest, and has already been
noticed in these pages, in our report of the Proceedings of the Botani-
cal Society of Edinburgh. The genera of which the author treats
are *Thalictrum* and *Polygala*.

In the third edition of his ‘Manual,’ Mr. Babington gives six Bri-
tish species of *Thalictrum* :—1. *alpinum* (2. *minus*; 3. *flexuosum*;
4. *saxatile*; 5. *majus*); 6. *flavum*. In the sixth edition of the ‘Bri-
tish Flora,’ the learned authors reduce these to three; uniting, under
the name of *minus*, the four above-mentioned species which we have
included in parentheses: but this step seems rather the result of non-
acquaintance with the plants, than of a careful investigation and com-
parison of their characters; for the authors merely assert, under *T.*
minus, that “*T. saxatile*, *Kochii*, *flexuosum*, and several others, are
mere forms of this;”—a mode of dismissing a difficult subject, that
will scarcely be held satisfactory.

Mr. Babington, having recently obtained extended materials, and
being assisted by the acute judgment of Mr. Hort, whose botanical
acumen has long been familiar to the readers of the ‘Phytologist,’ has
carefully considered the entire subject, and without acceding to the
extreme views entertained by the authors of the ‘British Flora,’
candidly admits that he now believes the *T. majus* of his ‘Manual’
was “formed out of larger states of each of the others, but especially
of *T. saxatile* and *T. flexuosum*.” The other three species he still
retains, giving the subjoined characters and synonyms :—

Thalictrum.

- “1. *T. minus* (Linn.); stem zigzag striated branched solid *leafless*
at the base, *stipules with inflexed auricles*, leaves 2-3 pinnate,
leaflets ternate 3-cleft glaucous, petioles with angular ascending

branches, panicle leafless with divaricate branches, flowers drooping, carpels fusiform 8-ribbed subcompressed ventricose below externally.

"*T. minus*, Koch, *Syn.* ed. 2, 4; Fries, *Summa*, 135; Reich. *Icon. Fl. Germ.* iii. t. 27!

"*T. majus*, Reich. *l. c.* t. 30.

"2. *T. flexuosum* (Reichenb.); stem zigzag striated branched leafy to the base, stipules with reflexed auricles, leaves 2-3-pinnate, leaflets 3-5-cleft paler beneath, petioles with patent divaricate branches, panicle leafy elongated with patent often reclinate branches, flowers drooping, carpels narrowly oblong subcompressed sub-10-ribbed gibbous within upwards.

"*T. flexuosum*, 'Bernh. Cat.' ex Reich. *Fl. excurs.* 728, et *l. c.* *Fl. Germ.* iii. 14, t. 28; Fries, *Summa*, 136, et *Herb. Norm.* vii. 24!

"*T. collinum*, Wallr. *Sched.* 259, teste Reich.

"*T. capillare*, Reich. *Fl. excurs.* 729, et *l. c.* *Fl. Germ.* iii. 15, t. 36.

"*T. majus*, Sm. *Eng. Bot.* t. 611, et *Eng. Fl.* iii. 42.

"3. *T. saxatile* (DC.); stem rather zigzag smooth but striated below the striated sheaths branched hollow leafy to the base, 'stipules with horizontal auricles' (Fries), leaves 2-3-pinnate, leaflets 3-5-cleft paler beneath, petioles subterete with patent not divaricate branches, panicle leafless erect pyramidal with patent straight branches, flowers drooping (?), carpels regularly oval.

"*T. saxatile*, DeCand. *Fl. Fr.* v. 633; Reich. *l. c.* *Fl. Germ.* iii. 15, t. 34; Gren. et Godr. *Fl. Fr.* i. 7 (excl. syn.).

"*T. Kochii*, Fries, *Mant.* iii. 46, et *Summa*, 136.

"*T. collinum*, 'Wallr.' teste Fries, *Herb. Norm.* vii. 25; Koch, *Syn.* ed. 1, 4."

Polygala.

In the third edition of his 'Manual,' Mr. Babington gave two species of *Polygala* as British, under the names of *vulgaris* and *amara*. In the sixth edition of the 'British Flora,' the authors sink the second species; explaining that they are unable to separate the British plant, so called, from the first. In neither of the works is there any notice of the mass of valuable matter published on the genus, in the 'Phytologist,' from the pens of Dr. Bromfield and others. The recent

discovery of *P. uliginosa* in Scotland, by those acute botanists, the Backhouses, as recorded in a late number of the 'Phytologist,' has induced Mr. Babington to revise and amend the characters he had previously assigned to the British species, or forms, of *Polygala*. The following are the characters which Mr. B. proposes :—

" 1. *P. vulgaris* (Linn.); *leaves scattered, lower leaves smaller oblong, upper leaves lanceolate, wings of the calyx obovate mucronate their nerves branched the lateral looping with a branch of the central nerve, capsule obcordate, lobes of the arillus unequal, lateral bracts shorter than the pedicels.*

" *P. vulgaris, auctorum.*

" *β. depressa*; *lower leaves crowded and often opposite but small, stem long wiry prostrate, racemes ultimately lateral.*

" *P. vulgaris*depressa, Fries, Mant. ii. 41.*

" *P. depressa, 'Wend.' ex Koch, Syn. ed. 2, 99; Coss. et Germ. Fl. Par. 56, t. 8; Bromf. in Phytol. ii. 966; Gren. et Godr. Fl. Fr. i. 196.*

" *P. serpyllacea, 'Weihe' ex Sond. Fl. Hamb. 388.*

" *γ. oxyptera*; *flowers smaller, fruit broader than the wings of the calyx.*

" *P. oxyptera, Reich. Iconog. i. f. 46!*

" *P. multicaulis, Tausch!*

" 2. *P. calcarea* (Schultz); *leaves chiefly in an irregular terminal tuft large obovate obtuse, leaves on the flower-shoot smaller lanceolate, wings of the calyx oblong their nerves branched the lateral looping with a branch from near the middle of the central nerve, capsule oblong obcordate, lobes of the arillus unequal, lateral bracts shorter than the pedicels.*

" *P. calcarea, Schultz in Bot. Zeit. (1837) 752, et 'Exsic. ii. 15; Koch, Syn. ed. 2, 100; Bab. Man. 39; Gren. et Godr. Fl. Fr. i. 196!; Walp. Rep. i. 232.*

" *P. amara, Reich. Fl. excurs. 350, et Fl. exsic. 749!; Eng. Bot. t. 2764!*

" *P. amarella, Reich. Iconog. i. f. 43, 44; Coss. et Germ. Fl. Par. 56, t. 7.*

"3. *P. austriaca* (Crantz); leaves in a rosette obovate obtuse larger than the oblong-lanceolate ones on the flower-shoot, wings of the calyx oblong or obovate obtuse their nerves simple or slightly branched free, capsule wedge-shaped below roundish broader than the wings, lobes of the arillus nearly equal, lateral bracts shorter than the pedicels.

"[*α. genuina*; leaves of the rosette smaller than those of the branching flower-shoot, flowers smaller, capsules rounded below.

"*P. austriaca*, 'Crantz, *Aust. v. 2*;' Reich. *Iconog. i. 23*, t. 21, f. 39, et *Fl. excurs. 350*, et *Fl. exsic. 1923*!].

"*β. uliginosa*; leaves of the rosette larger than those of the nearly constantly simple flower-shoot, flowers larger, capsules wedge-shaped.

"*P. uliginosa*, Reich. *Iconog. i. 23*, t. 21, f. 40, 41, et *Fl. excurs. 350*, et *Fl. exsic. 52*!; Fries, *Summa*, 154, et *Herb. Norm. iii. 14*!

"*P. myrtifolia*, Fries, *Nov. ed. 2*, 227; Wimm. et Grab, *Fl. Siles. iii. 24*.

"*P. amara*, Sven. *Bot. t. 484*; *Fl. Dan. t. 1169*.

"*P. austriaca*, Coss. et Germ. *Fl. Par. 56*, t. 7, not Reich."

The paper, *in extenso*, forms part of the 'Transactions of the Botanical Society of Edinburgh,' and will be received by botanists as a valuable contribution to our knowledge of the genera *Thalictrum* and *Polygala*; although we are fully aware that considerable difference of opinion will exist as to the *status* of the forms described. We are quite willing to leave this an open question, but at the same time acknowledge our great obligation to Mr. Babington, for the pains he has taken in collecting and arranging the materials so requisite to the formation of just conclusions.

On some Excrescences, &c., on Plants, occasioned or inhabited by Mites. By Mr. JAMES HARDY.*

A FEW days ago, I met with several small galls on the leaves of the hackberry (*Prunus Padus*), which I expected would furnish the larva of a gall-midge (*Cecidomyia*) or gall-fly (*Cynips*). They are

* From the 'Proceedings of the Berwickshire Naturalists' Club.'

green or slightly purplish, obovate, thickish, white, hirsute, and are scattered over the upper surface of the leaf, like a crop of minute mushrooms. On opening them I found them hollow, without any apparent inmate, or anything remarkable except a few hairs, the continuation apparently of a thick crop placed at their orifice in the depression on the under side of the leaf. A few pink objects, however, at length caught my attention; and on reflection, knowing that such excrescences were sometimes ascribed to mites, I resolved to ascertain if these were not such. Next day, on shaking a few upon a slip of glass, and placing them under the microscope, I observed that they exhibited motion; and some of them were not long in pushing out their legs and crawling slowly about. They were all in the larva state, elliptical, round-bodied, with four short legs placed close behind the head; the abdominal part is long and flexible, and has about four hairs before the tip, and about as many near the shoulders. They are too minute to be seen by the naked eye; even under a triple lens, they are mere linear atoms, without vestige of limbs. They are white, yellow, pale brown, or pinkish. Two species of mites were found on the outside: one, a yellowish rapidly running species, common upon foliage, that appears to deposit its ova upon the hairs of the plants on which it occurs; the other was a true, flattish, pale whitish, testaceous *Acarus*, and is most likely the parent of the young mites in the gall.

Knowing there were many similar galls on leaves, I next investigated those hairy purple warts so abundant near the midrib of the sloe, and found them likewise to be nests of apparently the same species of *Acarus*.

The alternate blisters along the sides of the alder-leaf, and occasionally found on that of the birch, gave the same result. The species on the alder is probably different. The old mite accompanying them is a mere point, and is well distinguished by two or three squarish brown spots near the tip of the abdomen.

The leaf of *Salix aurita* offers not less than four different galls: one large and smooth, occasioned by a black saw-fly, (Linn. Fn. Suec. 2301); two caused by the larvæ of unknown species of gall-midge, (*Cecidomyia*); and a fourth minute purple one, which is very abundant, and is analogous to those occurring on the sloe and bird-cherry. The last, like them, contains only young mites.

Another locality for mites I find in some round bud-like productions on the twigs of hazel. From green they become yellowish, and then wither. The larva is white, as is the accompanying mite.

A rough, pale green or purplish, fungus-like gall, which opens

from the under side of the leaf, is abundant on the foliage of the alder in some of our deans. This is also a nursery of young Acari.

A conspicuous yellow gall near the summits of the stalks of *Galium verum*, growing on the sea-coast, is also owing to mites. The round fleshy galls of this plant are caused by the larvæ of a *Cecidomyia*.

Colonies of young mites distort the leaves of *Galium Aparine*, *Lotus corniculatus*, *Polygala vulgaris*, and *Campanula rotundifolia*, by causing them to assume fantastic shapes, to become discoloured, to thicken, or their margins to roll inwards. The foliage of *Galium Aparine* is also affected in this manner from the presence of the larvæ of *Psylla velutina* of Foerster, (Verhand. Natur. Vereins. Preuss. Rheinlande, 1848, p. 87); which appears not to differ from *Ps. Galii* of the same author. This *Psylla* produces similar effects on *Galium palustre* and *G. uliginosum*; and it lives likewise upon the leaves of *Comarum palustre*.

The hoary, rounded, woolly tufts, so abundant in some places at the summit of the shoots of the wild thyme, are also the production of a crowd of young mites, as was first ascertained by Loew, (Dipterologische Beitr. iv. 24). Lightfoot (Flora Scot. i. 318) attributes them to a *Chermes (Psylla)*; and Bremi thought they were owing to the larvæ of a gall-midge. The two Bauhins considered plants in this condition as a distinct species; the ‘*Serpillum vulgare, minus, capitulis lanuginosis*,’ (C. Bauhini, Pinax, 220); ‘*S. vulgare, capitulis tomentaceis, candicantibus*,’ (J. Bauhini, Hist. Plant. iii. 269). Tournefort, however, conjectured that such appearances were owing to the irritation occasioned by some insect pricking the buds (Hist. Plantes des Environs de Paris, 149. Paris: 1698).

I have not had an opportunity of examining lately these white tufts on the wild thyme; but young specimens that I brought from Northumberland in July, afforded no traces of a gall-midge, to which they had been ascribed by various writers.

In conclusion, I may mention that I shall feel obliged to any member of the Club for fresh specimens of the following galls, should they ever occur during their researches:—

Smooth galls on the leaves of the beech.

Smooth galls on the leaves or buds of the lime.

Galls on the dyer’s green-weed, (*Genista tinctoria*).

Galls on the bryony and the box-wood.

Galls and excrescences on *Salix alba*, *S. purpurea*, and *S. fragilis*.

Large gall on the stalk of *Hieracium sabaudum* and *Cnicus arvensis*.

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-fourth Sitting.—Saturday, April 23, 1853.

MR. NEWMAN, President, in the chair.

Lathræa squamaria in Cultivation.

The President read the following note, from Mr. Edward T. Bennet, dated Brockham Lodge, Surrey, April 20, 1853 :—

“Two years ago, several roots of this interesting plant were brought from a hedge in a shady lane in this neighbourhood, and planted in a hollow at the base of a hazel-tree in a damp part of our garden, being carefully placed in contact with its roots. The spikes of flowers continued to develope in their new abode ; but this might readily have been the case without real growth having taken place. Last spring, it did not make its appearance ; and we concluded the plant was lost. About a fortnight ago, however, we were surprised and delighted to see a fine spike pushing up through the soil, and which is now expanding its curious flowers, in perfect vigour.

“Happening to be near its native locality yesterday, I paid it a visit, and was rewarded by finding it flourishing, and apparently much increased since this time two years. It is just now in perfection, and would well repay the visit of any one who is a stranger to it, otherwise than as a dried plant.

“The under-ground rhizoma occupies the sloping side of the bank, in large masses ; but, after careful examination, I was unable to detect any actual union between them and such other roots as were interspersed, or any fibres that appeared to be roots of the plant itself. Is it, or is it not, a parasite ? ”

The President said that he thought the parasitism of *Lathræa* was a universally-admitted fact. There was positive evidence on the subject, from the pen of that *infallible* observer, Mr. Wilson, in an early number of the ‘Phytologist’ (Phytol. i. 92) ; and Mr. Bowman had previously proved the fact, in the ‘Linneæan Transactions’ (see Phytol. i. 24).

MICROSCOPICAL SOCIETY OF LONDON.

January 26, 1853.—George Jackson, Esq., President, in the chair.

Stellate Bodies in the Cells of Fresh-water Algæ.

A paper by the Rev. Wm. Smith, 'On the Stellate Bodies occurring in the Cells of Fresh-water Algæ,' was read.

After referring to the papers by Mr. Shadbolt, 'On the Sporangia of some of the Filamentous Fresh-water Algæ,' published in the third volume of the 'Transactions of the Microscopical Society,' the author stated that the stellate bodies which form the subject of this paper are not, in his opinion, the result of conjugation, as supposed by Mr. Shadbolt, but of some disease affecting the cells in which they are found, being, in fact, bodies of a parasitic, or perhaps of a fungoid, growth, consequent upon the degeneration of the cell-contents. To these star-like bodies he proposes to give the name of Asteridia, and adduced various facts which he considered as confirmatory of the opinion he had brought forward, of these bodies being examples of a singular and far from common monstrosity, produced by a peculiar disease affecting that curious and interesting class of plants.

Fungus, &c., in a living Oak Tree.

A paper by Professor Quekett, 'On the Presence of a Fungus, and of Masses of Crystalline Matter, in the Interior of a living Oak Tree,' was read.

Mr. Quekett stated that while dining with a pic-nic party in Marlborough Forest, in the immediate vicinity of the 'King Oak,' a large limb of a neighbouring oak fell with a loud crash. On investigating the fractured portion, which was nearly three feet in diameter, the centre was seen to be covered with a white filamentous mass, studded here and there with numerous crystals. When examined microscopically, the white mass was found to be made up entirely of the fibres of a minute fungus, many spores of which were adherent to the fibres. The crystals were mostly of a tabular form, and were ultimately connected with the fungus, their composition being probably some salt of lime. No indications of decay were to be observed on the outside of the branch, nor any external wound whereby the spores could have gained access to the interior. All the parts of the wood in the neighbourhood of the fungus were rather softer than usual, and the woody fibres having been displaced by the growth of the filaments,

cavities were formed ; and in these the crystals were the most abundant. The occurrence of a fungus in the heart of a living oak-tree the author believed had never yet been recorded ; and its presence in this instance might lead to its detection in oak-timber previous to its being employed for building purposes.

THE PHYTOLOGICAL CLUB,
(*in connexion with the Pharmaceutical Society*).

April 4, 1853.—Robert Bentley, Esq., F.L.S., &c., President, in the chair.

A donation of British plants, from Mr. J. C. Braithwaite, was announced.

An adjourned discussion on M. Ville's experimental researches on vegetation took place.

Asplenium viride at Danny.

Mr. Reynolds introduced the subject of the discovery of *Asplenium viride* at Danny, communicated to the January meeting of the Botanical Society of London, by Mr. T. Moore (see *Phytol.* iv. 842).

That paper offering no clew to the origin of the station for the fern, he was induced to call attention to the following fact, which might throw some light upon the case. In Derham's 'Remains and Life of John Ray,' it is stated that the illustrious naturalist spent the latter end of 1667, and the beginning of 1668, at Danny, with Mr. Burrell and Mr. Courthope, both of whom had been his pupils, at Trinity College, Cambridge. There is no reason to suppose that the plant was introduced by Ray himself ; for, that he was then unacquainted with it, is shown, by its not being mentioned in his 'Catalogus' (ed. 2, 1677). In the 'Synopsis' (1690) it is given, but on the authority of Sibbald's 'Prodromus,' and the MS. notes of Edward Llywd.

May it not, however, reasonably be supposed that the then owner of Danny (Mr. Courthope) possessed tastes similar to those of his friend John Ray ? If so, it is probable that he had under cultivation interesting indigenous plants not belonging to the Flora of the neighbourhood ; and his attention could hardly fail to be attracted to the ferns, a class first put by Ray on at all an intelligible footing.

Once established, a plant may long retain its station. Specimens of *Hutchinsia petræa*, collected on the walls of the churchyard at Eltham, were exhibited to the meeting, having originally escaped from

the garden of Sherard, who died in 1728. That bricks may form a favourable groundwork for *Asplenium viride*, is shown by Mr. Newman in his 'History of British Ferns.' In mentioning a station for it at Ham Bridge, Worcestershire, he says:—"As I approached the bridge, the red bricks of which it is built, and the dry and dusty road which passed over it, seemed in no degree to increase the chance of success; yet on that bridge, facing the roadway and covered with dust, was the identical plant I sought—small indeed, but the species not to be mistaken."

Mr. Reynolds had observed (Phytol. iv. 210) that Mr. Newman had even extended his suggestion to him, as to the origin of *A. viride*, by referring *Ceterach* and *Dryopteris* to the same source.

Mr. Williamson was personally acquainted with the Flora of the district in question, and could state that it contained many things that had been certainly introduced. This was especially the case with a number of species found in a wood immediately at the back of the mansion; and he considered the most satisfactory way of accounting for their presence, was upon the supposition that they had, at some remote period, been cultivated by the possessor of Danny.

Tillandsia usneoides as a Substitute for Horse-hair.

The attention of the meeting was called to a vegetable substitute for horse-hair, in upholstery. It is called "American moss;" and chairs, &c., stuffed with it are exhibited for sale in some shops in London. It is the produce of *Tillandsia usneoides* (Bromeliaceæ), an epiphytic plant, growing on the cypress-trees upon the banks of the Mississippi River. At the first glance, its appearance is not unlike that of hair; but closer inspection shows the joints of its wiry stems. Although possessing some elasticity, it will not compare, in this respect, with horse-hair: its advantage consists in a smaller cost at first.

In connexion with this subject, it was mentioned that the indigenous carragheen (*Chondrus crispus*) used to be extensively collected on our coasts, for the purpose of stuffing mattresses.

[The following extract contains a further account of the *Tillandsia*:—*Ed. Phyt.*

"*Tillandsia usneoides* deserves, for its uses and appearance, to be shortly described. The stem is no bigger than a thread; the skin whitish, as if covered with hoar-frost, within tough and black like a horse-hair. Many of these together stick on the branches of the ebony or other trees, superficially by the middle, and send down on each side some of the same stems, very often a yard long, hanging on both sides, curled, or turning and winding one within another, and

resembling an old man's beard, whence its common name in Jamaica. The stems are branched, and the branches, which are two or three inches long, are set with roundish, white, frosted leaves. The flowers come out at the end of the branches. This slender parasitical plant is found among the trees in many parts of Jamaica, but does not grow so commonly, nor so luxuriantly, there as it does in the more northern provinces of the main continent, where it is said to overrun whole forests. It is frequently imported from Jamaica to North America, for the use of the saddlers and coach-makers, who commonly stuff their panels, cushions, &c. with it. In Louisiana and the neighbouring settlements, this plant being very carefully gathered and stripped of the bark, is made into mattresses, cushions, panels, &c. It is manufactured by tying the stalks in bunches, and sinking them in water, or burying them under ground in a moist place, until the bark rots: they are then taken up, boiled in water, and washed, until the fibres are quite cleared of the pulp. These are not only used instead of horse-hair, but are so very like it, that a man cannot distinguish them without a strict examination, and that even with a glass, unless he observes the branchings of it.

“The Bonana bird's nest is always made of the fibres of this plant, and is generally found hanging by a few threads from the tops of the most expanded branches of the most lofty trees, especially those that spread over ponds or rivers.”—*Loudon's Encyc. of Plants*, p. 248.]

The ‘Bonplandia,’ the official organ of the Imperial L. C. Academy Naturæ Curiosorum, announces that the six naturalists mentioned below have received the honour of Fellowship in the Academy, with the accompanying Academical names:—

1. H. C. Beck, Pastor in Schweinfurt = Metzger
 2. Anatol Nicolajewitsch, Prince of Demidoff, who,
it will be recollected, sent the principal part of
the Russian articles to the Exhibition of 1851 = Franklin
 3. Edward Newman, of London = Latreille
 4. F. L. Fülleborn, President of the Court of Appeal
in Marienwerder = Röschlaub
 5. F. Goldenberg, Professor of Natural History and
Mathematics in Saarbrücken = Steinhauer
 6. Philip Wirtgen, Ph. D., Director of the College
in Coblentz = Ehrhart
-

BENTALL'S BOTANICAL DRYING PAPER.

IN soliciting the attention of Botanists to the above Paper, Edward Newman begs to state that it is manufactured expressly for the purpose of *drying specimens for the Herbarium*. It possesses all the qualities required in such Paper, preserving form and colour in the best possible manner, and having the peculiar advantage of seldom, if ever, requiring a change of sheets whilst the plants are being dried, by which much time and trouble are saved. Its stoutness and durability also combine to render it economical, making it *practically* quite as cheap as ordinary Papers sold at a lower price. Edward Newman feels much pleasure in being able to state that its merits have been fully proved by our most eminent Botanists, whose valuable Testimonials in its favour are here subjoined.

*From Sir W. J. Hooker, K.H., L.L.D., F.R.A. and L.S., V.P.L.S.,
Director of the Royal Botanic Garden of Kew, &c., &c.*

“All I have to say is in its favour. It is the best Paper for the purpose I have ever employed.”

From C. C. Babington, Esq., M.A., F.L.S., F.G.S., F.B.S., &c., &c.

“I have now made use of your Paper during the whole of my summer tour in Scotland, and have found it to be by far the best Paper for drying specimens of Plants that I have ever used.”

From T. Bell Salter, Esq., M.D., F.L.S., &c.

“I have made sufficient trial of your Paper to congratulate myself on possessing that which will enable me to dry many more Plants than I could otherwise find time for. It has the advantage of rendering far fewer changes necessary; and in many instances, with plenty of Paper and plenty of pressure, no changing at all is required. In cases where the stems are thick, and the leaves dry quickly, as in the genus *Rubus*, it is very useful, for, from its elasticity, it fits down close to the leaves, and prevents their shrivelling, which they are apt to do in paper of other mechanical properties.”

From Hewett C. Watson, Esq., F.L.S., F.B.S., &c.

“I think it may safely be pronounced the best combination of the qualities required in such Paper that I have hitherto met with, after trying several kinds, both British made and Foreign.”

From the Rev. W. S. Hore, M.A., F.L.S., F.B.S., &c., &c.

“I highly approve of your new Paper for drying Plants, and consider it far preferable to the Cambridge Chalk-paper, which I previously employed, but which will now be discarded by me in the preparation

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From the Leading Article of the 'Gardeners' Chronicle' (April 5, 1845), edited by Professor Lindley, Ph. D., F.R.S., F.L.S., F.G.S., &c., &c.

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The Natural History of the Cedron.

By BERTHOLD SEEMANN, Esq., F.L.S., &c.

THE Cedron (*Simaba Cedron*, Planch.), one of the Simarubaceæ, has probably been known to the aborigines of New Granada from time immemorial, and was early brought to the notice of Europeans. In 'The History of the Buccaneers,' a work published in London in the year 1699, is to be found the first account of the Cedron. Its use as an antidote for the bites of snakes, and its place of growth,—the Island of Coyba, on the coast of Veraguas,—are there distinctly stated; but whether on the authority of the natives, or on that of the Buccaneers, does not appear. If the former was the case, the rovers must have become acquainted with the tree while on some of their cruises on the Magdalena river; for in the Isthmus of Panama its very existence was unsuspected until lately; the seeds being always imported from Cartagena. Mutis, as would appear from a communication of Dr. Cespedes, seems to have been acquainted with the Cedron, and doubtless wrote upon it; but, as most of his works were burnt, by order of the Spanish Government, on the principle that "learning did not become Creoles," that account has not been handed down to us. But, as may be suspected, a plant possessing such beneficial properties as the Cedron, and rendered famous by both the traditions and the history of the country which it inhabited, was not doomed to oblivion. About the year 1843, the Government of New Granada sent a commission of several medical men and students, accompanied by Dr. Cespedes, Professor of Botany in the University of Bogota, to ascertain what plant and locality produced the Cedron, and in what quantities the seeds might be procured. The commission seems to have reported so favourably upon the subject it was despatched to investigate, that the Cedron was speedily introduced into the pharmacopœias of New Granada; and it is now to be seen in all the apothecaries' shops of that republic. The commission did not settle the question botanically, still it may be said to have led to its solution; for when Mr. William Purdie, late Collector for the Royal Botanic Gardens at Kew, was at Bogota, his attention was directed to the plant in question by Dr. Cespedes, who supplied a tolerably correct drawing of it, and also information respecting the exact locality in which the celebrated antidote was to be met with. Mr. Purdie, taking advantage of the intelligence, proceeded, in 1846, to the banks of the Magdalena; but on reaching the village of Nari,

one of the places where the plant grows, he found that the inhabitants had already collected their little hoard of Cedron, and could only be induced to show to him a few seeds, unless he would purchase some, which he was not inclined to do, as all those shown to him had lost their germinating power; the people told him, moreover, that it would be useless to search for more fruit, all the trees having been already pillaged. Not deterred by such discouraging prospects, Mr. Purdie commenced searching the forest in all directions; and after an exertion of three days he succeeded in obtaining about thirty ripe fruits, and perfect leaves and flowers of the tree. Some of the seeds were sown in a Wardian case, and, together with the specimens for the herbarium, transmitted to the Royal Botanic Gardens at Kew, where the former soon became young plants, and whence they were distributed amongst various botanical and horticultural establishments; while the latter were briefly described by Dr. Planchon, in his dissertation on Simarubaceæ (Hooker's 'London Journal of Botany,' vol. vi. p. 566), under the name of Simaba Cedron. Attempts have been made to wrest from Mr. William Purdie the honour of having been the actual discoverer of the Cedron, and to confer it upon Dr. Luigi Rotellini. Historical evidence pronounces against such an arbitrary change. It is true that Dr. Rotellini, in a paper intitled 'Observazioni terapeutiche sopra alcuni Prodotti Vegetali della Nuova Granada,' printed in the 'Annali Medico-Chirurgici del Dottor Telemaco Metaxo' (anno vii. vol. xii. p. 281), drew the attention of the scientific world to the Cedron; but the learned Doctor himself never saw the tree, referred the plant to Apocynæ, and mixed up his account with various fables and inaccuracies, derived from oral communications of the aborigines; while Mr. Purdie not only inspected the tree in its *native* locality, and gave an intelligible account of its virtues and properties, but collected such specimens as enabled competent botanists to determine the systematical station of the plant.

It had been supposed that the Cedron was to be found only on the banks of the Magdalena; but, about the year 1845, a Panamanian gentleman ascertained it to grow in Darien; and, in 1847, 48, and 49, I myself found it in various parts of Darien, Veraguas, and Panama. The specimens transmitted by me, together with those previously sent by Mr. Purdie, enabled Sir Wm. J. Hooker to publish, in December, 1850, a full description of the plant, and accompany it by an excellent figure, from the skilful pencil of Mr. William Fitch. To complete the history of the Cedron, it is necessary to add that on the 7th of April,

1851, at a meeting of the Paris Academy of Science, it was announced that M. Lecoy had succeeded in separating the active principle on which the therapeutic properties of the Cedron depend, and that he had called it "*cedrine*." Thus, it took exactly 150 years, after the Cedron was first brought into notice, before a satisfactory account of the tree and its properties was obtained.

The Cedron seems to be confined to the republic of New Granada, ranging between about the 5th and 10th parallels of North latitude, and the 75th and 83rd of West longitude. It is generally met with on the outskirts of woods, on the banks of rivers, and on the seashore, but is never found under other trees; and although it occasionally forms small groves, yet it never constitutes extensive woods of itself, and must always be considered as a rare plant. The tree attains about fifteen feet in height; the stem, when about twelve feet high, produces a terminal panicle, which prevents it from prolonging itself; but, instead, side branches appear, which also, in their turn, send forth their terminal flowers and side branches. The effect of this mode of growth is, that the tree looks as if cut, something like *Salix capitata*, or perhaps more like a full-grown *Cycas circinalis*, and may therefore be called a "magnified umbrella." In diameter the stem seldom exceeds six inches. The pinnated leaves are glabrous, from two to three feet long, and have generally more than twenty leaflets. The panicle (not raceme) is very often from three to three and a half feet long, and bears flowers about an inch in diameter, the corollas of which are externally covered with a brownish hair; internally, they are glabrous, and of a greenish colour. The stamens are ten in number, and the ovaries five; but in most cases only one of the latter is developed into a mature fruit, the rest being usually abortive. The fruit, about the size of a swan's egg, has the appearance of an unripe peach, being covered with a short hair. Each of these fruits (drupes) contains one seed (the Cedron of commerce), easily separated into two large cotyledons, which look very much like blanched almonds, but are larger and plano-convex.

Every part of the plant, but especially the seed, is, owing to the presence of cedrine, intensely bitter. On account of this principle, it is extensively, and with considerable success, used in cases of intermittent fever, by the physicians of New Granada, a country in which forests of Quina-trees abound. But the chief reputation of the Cedron rests upon its being considered an efficacious antidote for the bites of snakes, scorpions, centipedes, and other noxious animals; and so highly do the natives of the land in which it grows value it,

that they will pay as much as from one to four shillings for a single seed. Indeed, there is hardly a person in New Granada or the adjacent states who does not possess a piece (cotyledon) of Cedron ; the lower classes carrying it on a cord around the neck ; the upper, mostly in their purses or cigar-cases. When any one is bitten, a little, mixed with water, is applied to the wound, and about two grains are scraped into brandy, or, in the absence of that liquor, into water, and administered internally ; and it is universally believed that the application will neutralize the venom of the most dangerous reptiles and other animals.

Nothing more seems to be known of the Cedron. Whether in all climates, and against the bites of all venomous animals, it will prove an efficacious antidote ; whether it will ultimately be considered a more powerful agent for counteracting the fever than quinine ; is at present impossible to say. One thing is certain,—that the Cedron, unless propagated by artificial means, will always be a scarce article, and consequently too expensive to be generally employed, or to be used as a substitute for drugs which, produced spontaneously by Nature, may be obtained in unlimited quantities, and at a cheap rate.

BERTHOLD SEEMANN.

Kew, April 1853.

Revision of the Genus Nymphaea. By Dr. C. LEHMANN.

SINCE the introduction of the *Victoria regia* into Europe, all water-plants, especially the *Nymphaeaceæ*, have engaged the attention of both botanists and gardeners ; in fact, they have become the fashion : and at such a time the publication of a monograph on *Nymphaeaceæ*, prepared by Dr. Lehmann, one of the most accomplished botanists of the day, is extremely opportune. The first section of this monograph has just appeared, and is to be considered as a *Prodromus*. Afterwards the whole is to be reprinted, and accompanied by figures of the new and little-known species. The following abstract* will give some notion of the vast labour the author has undertaken. For such a task Dr. Lehmann deserves the thanks of every naturalist ; and we sincerely hope that all those who may have in their possession any

* From E. Otto's 'Gartenzeitung,' May, 1853.

specimens of Nymphæaceæ, will not fail to send them to him for examination, as many of our most eminent *savans* have already done.*

NYMPHÆA.

De Cand. Syst. Veget. vol. ii. p. 49; *Endl. Gen. Plant.* No. 5020; *Planch. in Flore des Serres et Jard.* vol. vii. p. 293.

Coordinatio Nymphæarum, adjectis descriptionibus novarum specierum.

Sect. I. APPENDICULATÆ.

Staminibus omnibus vel saltem exterioribus appendice conico elongato colore petalorum supra antheras valde prominente instructis; foliis subpeltatis integerrimis vel subintegerrimis repandisve vel obsolete dentatis, rarius acute dentatis; rhizomate abbreviato perpendiculari tuberosi, vel discoideo v. subgloboso v. pyriformi v. fusiformi, radicibus sæpe valde incrassatis carnosis et bulbillis tuberibusve in nonnullis filo tenero matri alligatis.

Trib. I. LEUCANTHOS (Cyanea, DC. ex parte).

Floribus albis vel albo-virentibus.

* Foliis integerrimis nervis tenuibus. No. 1—9.

** Foliis amplis manifeste dentatis, nervis subtus prominentibus. No. 10—15.

Trib. II. RHODANTHOS.

Floribus roseis. No. 16—18.

Trib. III. BULBOPHYLLON.

Foliis integerrimis inter lobos bulbilliferis, floribus albis carneis vel cærulescentibus. No. 19—21.

* Dr. Lehmann earnestly begs that botanists will be kind enough to allow him the loan of their specimens of Nymphæaceæ. Any parcel addressed to Professor Dr. Lehmann, Hamburg, Botanischer Garten, will reach its destination.

Trib. IV. CYANANTHOS (Cyanea, DC.)

Floribus cæruleis vel cærulescentibus.

* Staminibus omnibus appendiculatis. No. 22—27.

** Staminibus exterioribus tantum appendiculatis. No. 28—30.

Sect. II. INAPPENDICULATÆ.

Staminibus connectivo brevissimo obtuso vix manifesto ultra antheras producto instructis, vel omnino apiculo destitutis.

Trib. I. LOTOS (Lotos, DC. ex parte).

Connectivo brevissimo obtuso vix manifesto ultra antheras paululum producto; foliis amplis, peltatis, umbonatis, nervis venisque subtus valde prominentibus areolatis; rhizomate et radicibus ut in appendiculatis.

* Foliis acute dentatis, dentibus mucrone aristiformi in plurimis terminatis et sinubus inter dentes semilunatis.

α. Floribus sanguineis. No. 31.

β. Floribus albis vel dorso rubellis. No. 32—36.

** Foliis irregulariter obtuse dentatis s. crenatis. No. 37—39.

Trib. II. CHAMÆLOTOS (Lotus, DC. ex parte).

Connectivo ut in Lotis; floribus albis; foliis in plurimis multo minoribus quam in trib. præcedente, subpeltatis, integerrimis, nervis venisque tenuibus vix prominulis; rhizomate et radicibus ut in appendiculatis. No. 40—50.

Trib. III. CASTALIA, Sal., DC.

Staminibus apiculo omnino destitutis; foliis integerrimis rarissime subdentatis, usque ad petiolum fissis; rhizomate elongato horizontali, cylindrico, repente.

* Floribus albis (Leuconymphæa, Boerh.) No. 51—63.

** Floribus cæruleis. No. 64.

Sect. I. APPENDICULATÆ.

Trib. I. LEUCANTHOS.

* Foliis integerrimis nervis tenuibus.

1. *Nymphæa Raja*, Lehm. (V. s.) N. foliis membranaceis tenuissimis sublunatis, lobis divaricatis s. patentissimis obtusis, glabris, subtus—

dum siccis—punctis elevatis sub lente manifestis; calyce tetrasepalo, sepalis longe acuminatis; petalis lanceolatis longe et argute acuminatis albis; staminibus valde elongatis radiatim expansis purpureis exterioribus brevi appendiculatis; stigmate 20-22-radiato: radiis longissimis. In Ecuador (Jameson); in Chili (Lehmann). Per.

2. *Nymphæa gracilis*, Zucc. in Abhandl. der Mathem. Physik. Klasse der Bayr. Acad. der Wissensch. vol. i. p. 362, No. 29. (V. s.)

3. *Nymphæa pulchella*, DC. Syst. Veget. vol. ii. p. 51, No. 5; ejusd. Prodr. vol. i. p. 115. (V. s.)

4. *Nymphæa maculata*, Thonng.; Schumach. in Act. Soc. Scient. Havn. (Vidensk. Selsk. Skrift.), 1827, p. 247. (V. s.)

5. *Nymphæa flavo-virens*, Lehm. in E. Otto Hambg. Garten- und Blumenz. viii. p. 370. (V. v.)

6. *Nymphæa abbreviata*, Guill. Perrtt. et Rich. Tent. Fl. Senegamb. fasc. i. p. 16.

7. *Nymphæa pseudo-pygmæa*, Lehm. (V. s.) N. foliis membranaceis subrotundis repandis, basi profunde bilobis sagittatis, lobis patentibus obtusiusculis, sinu triangulari, utrinque glabris, supra—si siccis—punctis minutis densissimis sub lente manifestis, calyce tetrasepalo; petalis lato-lanceolatis acutis albis calycem vix æquantibus; staminibus paucis appendiculatis; stigmate sub 12-radiato: radiis brevibus. Senegambia. Per.

8. *Nymphæa Leiboldiana*, Lehm. (V. s.) N. foliis coriaceis subpeltatis oblongis obtusiusculis vel ellipticis glabris, basi profunde bilobis, lobis acutiusculis basi arcuatis apice attingentibus vel incumbentibus, supra—si siccis—punctis minutissimis elevatis sub lente manifestis, subtus nervis prominulis subcanaliculatis; calyce tetrasepalo; petalis lanceolatis acutis albis; staminibus permultis appendiculatis erectis corolla dimidio brevioribus; stigmate multiradiato: radiis erectis incurvis. In terris Mexicanis (F. Leibold!); in Asia australi (Burke?). Per.

9. *Nymphæa tropæolifolia*, Lehm. (V. s.) N. foliis coriaceis orbicularibus subpeltatis repandis vel obtuse remoteque dentatis, utrinque glabris læte viridibus, basi profunde bilobis, lobis incumbentibus obtusiusculis, supra—si siccis—punctis elevatis minutissimis sub lente manifestis, subtus nervis prominulis parum impressis; calyce tetrasepalo; petalis oblongo-lanceolatis acutis albis; staminibus erectis longe appendiculatis; stigmate sub 16-radiato: radiis acutis inflexis. Habitat in Brasilia prope Bahiam in aquis stagnantibus, et in Surinamia. Per.

** Foliis amplis manifeste dentatis, nervis subtus prominentibus.

10. *Nymphæa speciosa*, Mart. et Zucc. Abhandl. der Mathem. Physik. Klasse der Bayr. Acad. der Wissensch. vol. i. p. 361, No. 28. *N. reticulata*, Mart. Sched. de *Nymph.* in *Itin. Brasiliens. Conscript.* No. 3313, MSS. (V. s.)

11. *Nymphæa undulata*, Lehm. (V. s.) *N.* foliis coriaceis ovato-suborbicularibus subpeltatis glaberrimis utrinque pallide viridibus, irregulariter dentatis vel subsinuatis, basi profunde bilobis, lobis approximatis obtusiusculis, subtus nervis prominentibus ibidemque tenuissime impresso-punctatis; calyce tetrasepalo undulato; petalis oblongis acutatis albis superne undulatis; staminibus permultis erectis acute appendiculatis; stigmate sub 12-radiato: radiis abbreviatis acutis. Nuphar fleur blanche charnue, *H. Galeotti*, *Collect.* 1840, No. 4846? Habitat in terris Mexicanis. Per.

12. *Nymphæa ampla*, Hook. Bot. Magaz. vol. lxxv. tab. 4469 (excl. syn. DC.); A. Gray, Plant. Wrightian. Texano—Mexic. pars i. p. 7. *Castalia ampla*, *Salish.* (V. s.)

13. *Nymphæa nervosa*, Herb. Steud. (nomen.) (V. s.) *N.* foliis amplis coriaceis subpeltatis suborbicularibus glabris utrinque viridibus basi profunde bilobis, lobis elongatis incumbenibus, inæqualiter acuteque sinuato-dentatis nervosis, nervis venisque utrinque valde conspicuis subtus prominentibus canaliculatis; calyce sex-sepalo; corolla alba magna, petalis inæqualibus, exterioribus oblongis obtusiusculis, interioribus lineari-lanceolatis longe acutatis; staminibus appendiculatis; stigmate multiradiato. In Brasilia australi (J. Hansen, herb. propr.); in Paraguay (Bergger, Herb. Steudel.) Per.

14. *Nymphæa nubica*, Lehm. (V. s.) *N.* foliis amplissimis membranaceis peltatis suborbiculato-ovatis glabris, irregulariter obtuseque repando-dentatis subsinuatis, basi profunde bilobis, lobis incumbenibus obtusiusculis, utrinque viridibus, supra glaucescentibus ad nervos venasque punctis elevatis sub lente conspicuis, subtus grosse areolatis nervis parum prominentibus; floribus amplis patentissimis albis; calyce tetrasepalo maculato; staminibus appendiculatis; stigmate sub 16-radiato. *Nymphæa ampla*, *Kotschy*, *Iter Nubic.* No. 167 (ex parte!) In stagnis pluvialibus ad radices mont. Cordofani. Per.

15. *Nymphæa versicolor*, Roxbg. Bot. Magaz. vol. xxix. tab. 1189; Roxbg. Fl. Ind. vol. ii. p. 577, No. 3; DC. Syst. Veg. vol. ii. p. 15, No. 12; ejusd. Prodr. vol. i. p. 115. Nuphar versicolor, *Reich. Fl. Exot.* vol. i. tab. 15 (fig. e Bot. Magaz. l. c.) *Castalia versicolor*, *Salish.*

Trib. II. RHODANTHOS.

16. *Nymphæa bella*, Lehm. (V. s.) N. foliis submembranaceis peltatis oblongis rotundato-obtusis, medio præsertim acute repando-dentatis, basi profunde bilobis, lobis dente acuto terminatis, sinu aperto, supra glabris punctis elevatis ad lentem manifestis, subtus densissime pubescentibus cinereis; calyce tetrasepalo; corolla polypetala rosea, petalis inæqualibus angusto-lanceolatis obtusiusculis; staminibus appendiculatis; stigmatibus sub 12-radiato: radiis brevibus subplanis. In India Orientali. Per.

17. *Nymphæa Hookeriana*, Lehm. (V. s.) N. foliis coriaceis peltatis ovalibus repandis basi profunde bilobis, lobis obtusiusculis, sinu aperto, utrinque viridibus glabris supra impressis punctatis, subtus—dum siccis—punctis minutissimis elevatis sub lente conspicuis, nervisque canaliculatis; calyce tetrasepalo; petalis ex ovato oblongis obtusiusculis roseis; staminibus acute longeque appendiculatis; stigmatibus sub 10-radiato: radiis brevibus erectis. In Benghalia (J. D. Hooker). Per.

18. *Nymphæa rhodantha*, Lehm. (V. s.) N. foliis submembranaceis subpeltatis ovalibus utrinque glabris vinoso-rubentibus, irregulariter repando-dentatis, basi profunde bilobis, lobis approximatis sive incumbentibus obtusiusculis vel acutis, supra—dum siccis—punctis elevatis minutis sub lente manifestis, subtus nervis prominulis canaliculatis; calyce tetrasepalo; petalis oblongis obtusiusculis roseis; staminibus obtuse appendiculatis; stigmatibus sub 12-radiato: radiis erectis apice hamato-inflexis. In insulis Philippinis. Per.

Trib. III. BULBOPHYLLON.

19. *Nymphæa vivipara*, Lehm. in E. Otto Hambg. Garten- und Blumenz. viii. p. 370. N. micrantha, Bot. Magaz. vol. lxxvi. tab. 4535 (excl. syn.) N. cærulea, β. albida, Rich. Tent. Fl. Senegamb. fasc. i. p. 15. (V. v.)

20. *Nymphæa guineensis*, Thonng.; Schum. in Act. Soc. Scient. Havn. (Vidensk. Selsk. Skrift.) 1827, p. 248. N. micrantha, Hortul. (non Rich.) (V. v.)

21. *Nymphæa micrantha*, Guill. Perrott. et Rich. Fl. Senegamb. fasc. i. p. 16.

Trib. IV. CYANANTHOS.

* *Staminibus omnibus appendiculatis.*

22. *Nymphæa Edgeworthii*, Lehm. in E. Otto Hambg. Garten- und Blumenz. viii. p. 372. *N. punctata*, *Edgewth. in Trans. Linn. Soc.* vol. xx. p. 29, No. 15 (non Kar. et Kir.)

23. *Nymphæa stellata*, Willd. Spec. Plant. tom. ii. pars ii. p. 1153; Andr. Bot. Repos. vol. v. tab. 330; DC. Syst. Veg. vol. ii. p. 51, No. 4; ejusd. Prodr. vol. i. p. 115; Wight, Icon. Plant. tab. 178 (tab. non inspecta); Roxbg. Fl. Ind. vol. ii. p. 597, No. 6; Rheed. Hort. Malab. vol. xi. tab. 27. *N. malabarica*, *Poiret in Encycl. Méthod. Botan.* iv. p. 457, No. 4. *N. Nouchali*, *Burm. Encycl. Méthod.* l. c. No. 7; *Poiret, Conf. DC. Syst. Veg.* vol. ii. p. 51, Obs. ad No. 4. *Castalia stellaris*, *Salisb.* *Lobocarpus Candollianus*, *Wight et Arntt. Herb. Wight.* No. 55 (fide speciminum). *β. major*, *Bot. Magaz.* vol. xlv. tab. 2058. *N. cyanea*, *Roxbg. Fl. Ind.* vol. ii. p. 577, teste Wight et Arntt. Prodr. Fl. Penins. Ind. Orient. p. 17, No. 55, et fide spec. authent. *N. Cochlara*, *Roxbg. Icon. in Mus. Soc. Ind. Orient. Lond. et in Muss. Hook.* tab. 659, teste Wight et Arntt. l. c. in *Add.* p. 446. *γ. flore albo.* (V. v. *α.* et *γ.*, *β. v. s.*)

24. *Nymphæa madagascariensis*, DC. Syst. Veg. vol. ii. p. 50, No. 3; ejusd. Prodr. vol. i. p. 114.

25. *Nymphæa capensis*, Thunbg. Prodr. et Fl. Capens. ed. Schult. p. 431; Conf. Lehm. in E. Otto Hambg. Garten- und Blumenz. viii. p. 372. *N. cærulea*, *Bot. Mag.* vol. xvi. tab. 552; *Andr. Bot. Repos.* vol. iii. tab. 197. *N. scutifolia*, *DC. Syst. Veg.* vol. ii. p. 50, No. 1; *ejusd. Prodr.* vol. i. p. 114; *Flore des Serres et Jard.* vol. vi. No. 645. *Castalia scutifolia*, *Salisb.* (V. v.)

26. *Nymphæa discolor*, Herb. Steud. (nomen). (V. s.) *N. foliis submembranaceis subpeltatis ovato-orbicularibus glabris amplissimis, irregulariter sinuato-crenatis basi profunde bilobis, lobis basi incumben- tibus subparallelis obtusiusculis, subtus atrosanguineis nervis venisque ibidem prominulis viridibus; floribus amplis patentissimis cyaneis; calyce tetrasepalo; petalis oblongo-lanceolatis biseriatis subæqualibus; staminibus numerosis omnibus longe appendiculatis; stigmatibus sub 12-radiato.* *N. ampla*, *Hochst. Herb. Unius Itin.* (ex parte!) In Nubia (Kotschy). Per.

27. *Nymphæa pæcila*, Lehm. in E. Otto Hambg. Garten- und Blumenz. viii. p. 371 et 425. *N. cærulea*, *Sieber, Herb.* (ex parte!) (V. v.)

** *Staminibus exterioribus tantum appendiculatis.*

28. *Nymphæa elegans*, Hook. in Bot. Magaz. vol. lxxvii. tab. 4604; A. Gray, Plant. Wrightian. Texano—Mexican. pars i. p. 7 et 129. (V. s.)

29. *Nymphæa cærulea*, Sav. in Annal. du Muséum d'Hist. Nat. vol. i. p. 366, tab. 25; Venten. Jard. de la Malmais. tab. 6; Del. in Descript. de l'Egypte, ed 2, tom. xix. p. 422, tab. 60, fig. 2; DC. Syst. Veg. vol. ii. p. 50, No. 2; ejusd. Prodr. vol. i. p. 114; Fl. des Serres et Jard. vol. vii. No. 653 (?). β . *flore albo*. N. rufescens, Guill. Perr. et Rich. Tent. Fl. Senegamb. fasc. i. p. 15 (?). *Castalia cærulea*, Trattn. (V. v.)

30. *Nymphæa gigantea*, Hook. in Bot. Magaz. vol. lxxviii. tab. 4647; Fl. des Serres et Jardins, vol. vii. No. 751 (eadem figura). (V. s.)

Sect. II. INAPPENDICULATÆ.

Trib. I. LOTOS.

* Foliis acute dentatis, dentibus mucrone aristiformi in plurimis terminatis et sinubus inter dentes semilunatis.

α . Floribus sanguineis.

31. *Nymphæa rubra*, Roxbg. Andr. Bot. Repos. vol. viii. tab. 503; Roxbg. Fl. Ind. vol. ii. 576; ejusd. Icon. in Mus. Soc. Ind. Orient. Lond. et in Mus. Hook. tab. 657, teste Wight et Arnth. Prodr. Fl. Penins. Ind. Orient. in Add. p. 447; Bot. Magaz. vol. xxxi. tab. 1280; DC. Syst. Veg. vol. ii. p. 52, No. 7; ejusd. Prodr. vol. i. p. 115; Wight, Illustr. of Ind. Bot. vol. i. tab. 10; Paxt. Mag. of Gard. and Bot. vol. xi. p. 265, cum icon.; Flore des Serres et Jard. vol. vi. No. 629 (ead. fig.); Fl. des Serres, vol. vii. No. 759—60; Lindl. and Paxt. Fl. Gard. 1851, No. 17, tab. 50. *Nuphar rubrum*, Reichenb. Fl. Exot. vol. i. tab. 16 (fig. e Bot. Magaz.) *Castalia magnifica*, Sal. Par. Lond. tab. 14 (tab. non inspecta), ex DC. Syst. Veg. β . *Devoniensis*. N. *Devoniensis*, Hook. in Bot. Magaz. vol. lxxviii. tab. 4665. γ . *rosea*, Bot. Magaz. vol. xxxiii. tab. 1364. (α . v. v., β . v. s.)

β . Floribus albis vel dorso rubellis.

32. *Nymphæa pubescens*, Willd. Spec. Plant. tom. ii. pars ii. p. 1154; DC. Syst. Veg. vol. ii. p. 52, No. 8; ejusd. Prodr. vol. i. p. 115 (excl. syn. Pal. de Beauv.); Roxbg. Icon. in Mus. Soc. Ind. Orient. Lond. et in Mus. Hooker. tab. 658, teste Wight et Arnth.; Prodr. Fl. Penins. Ind. Orient. in Add. p. 447; Blume, Bijdrag. tot de Fl. van Nederl. Indië, vol. i. p. 48. *Castalia sacra*, Salisb. (V. s.)

33. *Nymphæa Lotos*, Linn. Sp. Plant. p. 729; Alpin, de Plant. Exotic. tab. 213, 216, 218, 220, 222, 224, 226; Del. in Annal. du Muséum d'Hist. Nat. vol. i. p. 372, et in Descript. de l'Égypte, ed. 2, vol. xix. p. 415, tab. 60, fig. 1 (excl. syn. Pal. de Beauv. Waldst. et Kit. Bot. Mag. et Rheed.); DC. Syst. Veg. vol. ii. p. 53, No. 9; ejusd. Prodr. vol. i. p. 14; Roxb. Fl. Ind. vol. ii. p. 557; Icon. Plant. in China nasc. e Bibl. Braam. tab. 16 (tab. non inspecta); Rich. Tent. Fl. Seneg. fasc. i. p. 14. *Castalia mystica*, *Salisb.* (ex parte). β . *semiaperta*. N. Lotus, β , *Guill. Perrot et Rich. Tent. Fl. Seneg.* l. c.; *Rheed. Hort. Malab.* vol. xi. tab. 26. N. pubescens, *nonnull.* *Auct.* (non Willd.) (V. s. α . et β .)

34. *Nymphæa dentata*, Thonng.; Schumach. in Act. Soc. Scient. Havn. (Vidensk. Selsk. Skrift.) 1827, p. 249; Bot. Magaz. vol. lxxii. tab. 4257; Flore des Serres et Jardins, vol. vi. No. 627—628 (?). (V. v.)

35. *Nymphæa thermalis*, DC. Syst. Veg. vol. ii. p. 54, No. 10; ejusd. Prodr. vol. i. p. 115; Reichenb. Icon. Fl. Germ. tab. 71; Fl. des Serres et Jard. vol. vii. No. 706, 707. N. Lotus, *Andr. Bot. Repos.* vol. vi. tab. 391; *Bot. Magaz.* vol. xxi. tab. 797; *Waldst. et Kit. Plant. Rar. Hung.* vol. i. tab. 15 (excl. syn.) *Castalia mystica*, *Salisb.* (ex parte). (V. v.)

36. *Nymphæa Candolliana*, Lehm. N. ampla, *DC. Syst. Veg.* vol. ii. p. 54, No. 11 (excl. syn. *nonnull.* et var. β .); ejusd. *Prodr.* vol. i. p. 115 (non *Salisb.*); *Plum. MSS.* 123, tab. 4 (tabula non inspecta), ex DC. (V. s.)

** Foliis irregulariter *obtusè* dentatis s. crenatis.

37. *Nymphæa Rudgeana*, Meyer, Prim. Fl. Essequib. p. 198. N. ampla, β . *Rudgeana*, *DC. Syst. Veg.* vol. ii. p. 54, sub No. 11; ejusd. *Prodr.* vol. i. p. 115. (V. s.)

38. *Nymphæa sinuata*, Salzm. In vicinibus Obidos, Prov. Para (R. Spruce). *Nymphæa* foliis circinnatis minoribus *obtusè* crenatis, flore albo. *Plum. Catal.* p. 7; *Msc.* 122, tab. 4 et 141, tab. 5 (?), (tab. non inspectis). (V. s.)

39. *Nymphæa semisterilis*, Lehm. (V. s.) N. foliis coriaceis ovato-suborbicularibus subretusis subpeltatis glabris sinuato subcrenatis basi profunde bilobis, lobis contingentibus basi incumbens obtusis, superne—dum siccis—punctis minutis densissimis elevatis sub lente conspicuis, subtus impresso-punctatis nervosis; calyce tetrasepalo; petalis albis calycem æquantibus; staminibus inappendiculatis biseriatis, exterioribus sterilibus sublinguæformibus, interio-

ribus fertilibus multo brevioribus; stigmate sub 16-radiato. In India Orientali ad Maradabad. Per.

Trib. II. CHAMÆLOTOS (Lotos, DC. ex parte).

40. *Nymphæa edulis*, DC. Syst. Veg. vol. ii. p. 52, No. 6; ejusd. Prodr. p. 115; Wight et Arntt. Prodr. Fl. Penins. Ind. Orient. p. 447. N. esculenta, Roxbg. Fl. Ind. vol. ii. p. 578, No. 5; ejusd. Icon. in Mus. Soc. Ind. Orient. Lond. et in Mus. Hooker. tab. 660, teste Wight et Arntt. l. c. N. Coteka, Roxb. MSS. cum ic. in Bibl. Banks. (teste DC.) Castalia edulis, Salisb. (V. s. incompl.)

41. *Nymphæa lasiophylla*, Mart. et Zucc.; Abhandl. der Mathem. Physik. Klasse der Bayr. Acad. der Wissenschaft. vol. i. p. 364, No. 31; Mart. Sched. de Nymph. in Itin. Brasiliens. Conscript. No. 2377, MSS. (V. s.)

42. *Nymphæa sagittata*, Edgew. in Trans. Linn. Soc. vol. xv. p. 29, No. 16 (an hujus locis?).

43. *Nymphæa mexicana*, Zucc. Abhandl. der Math. Physik. Klasse der Bayr. Acad. der. Wissenschaft. vol. i. p. 365, No. 32. (V. s.)

44. *Nymphæa albo-viridis*, A. de St. Hilaire; Voyage dans le District des Diamans et sur le Littorale du Brésil, vol. ii. p. 426 (an hujus locis?).

45. *Nymphæa Maximiliani*, Lehm. (V. s.) N. foliis membranaceis subpeltatis late ovatis obtusissimis glabris, basi profunde bilobis, lobis ovatis obtusis patentissimis, supra—dum siccis—punctis elevatis minutis sub lente manifestis, subtus dense purpureo-maculatis; calyce tetrasepalo; petalis inæqualibus candidis obtusiusculis; staminibus inappendiculatis inæqualibus, exterioribus basi petaloideis; stigmate sub 12-radiato: radiis elongatis hamato-incurvis. Prope Bahiam (Neuwied). Per.

46. *Nymphæa sagittariæfolia*, Lehm. (V. s.) N. foliis membranaceis sagittatis obtusis glabris saturate viridibus subrepandis, supra—dum siccis—punctis minutis, subtus lineis permultis tenuissimis atropurpureis ubique excurrentibus sub lente manifestis instructis, lobis baseos patentibus acutis; petiolo flaccido in sinu folii, scapo multo graciliore; calyce tetrasepalo; petalis oblongis obtusiusculis calyce brevioribus; staminibus inappendiculatis; stigmate multiradiato; radiis valde elongatis erectis subclavatis. In America centrali (Lehmann). Per.

47. *Nymphæa lineata*, A. de St. Hilaire, Voyage dans le District des Diamans et sur le Littorale du Brésil, vol. ii. p. 425 (an hujus locis?).

48. *Nymphæa amazonum*, Mart. et Zucc.; Abhandl. der Math. Physik. Klasse der Bayr. Acad. der Wissenschaft. vol. i. p. 360, No. 30; Mart. Sched. de Nymph. in Itin. Brasiliens. Conscript. No. 3313, MSS. *N. integrifolia*, Salzmann. *N. foetida*, Gardner. MSS. (V. s.)

49. *Nymphæa Passiflora*, Lehm. (V. s.) *N. foliis submembranaceis subpeltatis rotundato-obtusis basi sagittatis, lobis patentibus acutiusculis, sinu fere triangulari, utrinque viridibus glabris, supra—dum siccis—punctis minutis elevatis sub lente conspicuis; calyce tetrasepalo; petalis inæqualibus acutis albis calyce brevioribus; staminibus radiantibus exterioribus apiculatis longitudine fere petalorum; stigmate 16-radiato: radiis longissimis linguæformibus rotundato-obtusis. In Brasilia (Serra d'Estrella) (C. Beyrich); in Paranagua (Gardner). Per.*

50. *Nymphæa Fenzliana*, Lehm. (V. s.) *N. foliis membranaceis suborbicularibus obtusissimis basi profunde bilobis, lobis obtusiusculis, sinu marginibus arcuatis aperto, supra gramineo-viridibus glabris—dum siccis—punctis minutissimis elevatis sub lente manifestis, subtus demum subferrugineis; calyce tetrasepalo; petalis candidis exterioribus acutiusculis reliquis lanceolatis acuminatis; staminibus inappendiculatis basi valde dilatatis; stigmate 22-24-radiato: radiis adscendentibus valde elongatis clavatis incurvis. San Juan de Nicaragua. Per.*

Trib. III. CASTALIA.

* Floribus albis (*Leuconymphæa*, Boerh.).

51. *Nymphæa acutiloba*, DC. Prodr. vol. i. p. 116, No. 20; Icon. Plant. in China nasc. e Bibl. Braam. tab. 18 (tab. non inspecta).

52. *Nymphæa odorata*, Ait. Hort. Kew. ed. 1, vol. ii. p. 292; DC. Syst. Veg. vol. ii. p. 57, No. 15; ejusd. Prodr. vol. i. p. 116; Asa Gray, Gen. Plant. Fl. Americ. Boreal-Orient. vol. i. p. 101, tab. 42—

43. *α. orbicularis*. *N. odorata, α.*, Torr. et Gray, *Fl. of North Amer.* vol. i. p. 57. *N. odorata, Andr. Bot. Repos.* vol. v. tab. 297; *Bot. Magaz.* vol. xxi. tab. 819; *Willd. Hort. Berolin.* tab. 39. *N. alba, Michx. Fl.* vol. i. p. 311. *Castalia pudica, Salisb. β. reniformis*. *N. odorata, β.*, Torr. et Gray, *Fl. of North Amer.* l. c. *N. reniformis, Walt. Fl. Car.* p. 155; *DC. Syst. Veg.* vol. ii. p. 55, No. 13; *ejusd. Prodr.* vol. i. p. 115; *Deless. Icon.* vol. ii. tab. 15. *Nelumbium reniforme, Willd. Spec. Plant.* tom. ii. pars ii. p. 1260. *γ. minor*. *N. odorata, γ.*, Torr. et Gray, *Fl. of North Amer.* l. c. *N. odorata, β. minor, Bot. Magaz.* vol. xl. tab. 1652. *N. odorata, β. rosea, Pursh,*

Fl. Americ. Septembr. vol. i. p. 369. *N. minor*, *DC. Syst. Veg.* vol. ii. p. 58, No. 16; *ejusd. Prodr.* vol. i. p. 116. (α . et γ . v. v., β . v. s.)

53. *Nymphæa nitida*, Sims in *Bot. Magaz.* vol. xxxiii. tab. 1359; *DC. Syst. Veg.* vol. ii. p. 58, No. 17 (excl. *Synon. Gmel. et Willd.*); *ejusd. Prodr.* vol. i. p. 116.

54. *Nymphæa blanda*, Meyer, *Prim. Fl. Essequib.* p. 201; *DC. Syst. Veg.* vol. ii. p. 59, No. 19; *ejusd. Prodr.* vol. i. p. 116. (V. s.)

55. *Nymphæa alba*, L., α . *Linn. Spec. Plant.* 729; *DC. Syst. Veg.* ii. p. 56, No. 14; *ejusd. Prodr.* vol. i. p. 115; *Koch, Synops. Fl. Germ. et Helv.* ed. 2, p. 29; *Gaertn. de Fructib.* vol. i. tab. 19; *Schkuhr, Handb.* vol. ii. tab. 142; *Fl. Dan.* vol. iv. tab. 602; *Engl. Bot.* vol. iii. tab. 160; *Sevensk. Bot.* vol. ii. tab. 92; *Hayne, Arznei-gew.* vol. iv. tab. 35; *Reichenb. Icon. Fl. Germ.* tab. 67; *Sturm in Abhandl. der Naturf. Gesell. zu Nürnberg.* fasc. i. p. 148, tab. 3, fig. 8—13. *N. splendens*, *urceolata*, *venusta* et *rotundifolia*, *Hentze in Mohl et Schlecht. Bot. Zeitg.* 1848, p. 603, 699—700 (fide specim. ab ipso auct. benevole mecum communicat.) *Castalia speciosa*, *Salisb.* † *N. biradiata*, *Sommerauer in Regensb. Bot. Zeitg.* 1833, No. 40, p. 625; *Conf. Observ. Ibid.* p. 631; *Reichenb. Icon. Fl. Germ.* tab. 69; *Koch, Synops. l. c.*; *Cons. E. Fries, Summa Veget. Scandinav.* i. p. 143, et *Lehm in E. Otto Hambg. Garten- und Blumenz.* viii. p. 369. *N. intermedia*, *Weiker in Reichenb. Fl. Saxon.* ed. 2, p. 10 (?). *N. erythrocarpa*, *Hentze in Mohl et Schlechtend. Bot. Zeitg.* 1852, p. 747. β . *minor*, *Bess. Hort. Eystett. Vern. Ord.* vii. tab. 3, fig. 2; *DC. Syst. Veg.* vol. ii. p. 56, No. 14; *ejusd. Prodr.* p. 115; *Koch, Synops. Fl. Germ. et Helv.* l. c.; *Reichenb. Icon. Fl. Germ.* tab. 68 (?). *N. parviflora*, *Hentze in Mohl et Schlecht. Bot. Zeitg.* 1848, l. c. (?). (V. v.)

56. *Nymphæa basniniana*, *Turczan. Fl. Baical. Davur.* No. 84; *Ledeb. Fl. Ross.* vol. ii. p. 743. (V. s.)

57. *Nymphæa pauciradiata*, *Bunge in Ledeb. Fl. Alt.* vol. ii. p. 272; *Ledeb. Fl. Ross.* vol. i. p. 84. (V. s.)

58. *Nymphæa semiaperta*, *Klinggræff, Fl. von Preuss.* p. 20; *Sturm in Abhandl. der Naturf. Gesell. zu Nürnberg.* fasc. i. p. 143, tab. 3, fig. 1—7; *Conf. Lehm. in E. Otto Hambg. Garten- und Blumenz.* viii. p. 369. *N. neglecta*, *Hausleutn. in Mohl et Schlechtend. Bot. Zeit.* 1850, p. 905, 1852, p. 421. (V. v.)

59. *Nymphæa candida*, *Presl, Del. Pragens.* p. 224; *Koch, Synops. Fl. Germ. et Helv.* ed. 2, p. 29; *Reichenb. Icon. Fl. Germ.* tab. 70.

60. *Nymphæa Kosteletzkyi*, *Palliardi; Lehm. in E. Otto Hambg. Garten- und Blumenz.* viii. p. 369. (V. v.)

61. *Nymphæa cachemiriana*, Jacquemt. Voy. dans l'Inde, vol. iv. p. 11, tab. 10.

62. *Nymphæa punctata*, Kar. et Kir. Enumerat. Plant. Fl. Alt. No. 50; Ledeb. Fl. Ross. vol. i. p. 743.

63. *Nymphæa pygmæa*, Ait. Hort. Kew. ed. alt. vol. iii. p. 293; Bot. Magaz. vol. xxxviii. tab. 1525; D.C. Syst. Veg. vol. iii. p. 58, No. 18; ejusd. Prodr. p. 116. *N. tetragona*, *Georgi Iter*, vol. i. p. 220; *N. alba minor*, *Gmel. Fl. Sibir.* vol. iv. tab. 71. *Castalia pygmæa*, *Salisb. Par. Lond.* tab. 68 (*ex DC.*) (V. s.)

** Floribus cæruleis.

64. *Nymphæa violacea*, Lehm. (V. s.) *N. foliis coriaceis subovatis repandis cordato-bilobis, lobis obtusis, sinu marginibus arcuatis extrorsum aperto, glabris supra flavescenti-viridibus—dum siccis—punctis elevatis minutissimis sub lente manifestis, subtus saturate purpureis; calyce tetrasepalo; petalis saturate violaceis exterioribus majoribus obovato-oblongis; staminibus inappendiculatis numerosissimis stigma sub 10-radiatim totum tegentibus. β. cærulea, floribus majoribus et petalis angustioribus. In Nova Hollandia Boreali collegit α. J. Anderson; α. et β. Cape York (J. Macgillivray). Per.*

Quid *N. crenulata*, *Rafinesq.*; *Schmaltz. in Med. Repos. of New York*, vol. v. (nomen) *ex Desvaux, Journ. de Botanique*, vol. ii. p. 173?

NOTICES OF NEW BOOKS, &c.

‘*The Annals and Magazine of Natural History*,’ No. 65, May, 1853.

The botanical papers in this number are intituled:—

‘On the Occurrence of Palms and Bambus [Bamboos] with Pines and other Forms considered Northern at considerable elevations on the Himalaya; by Major Madden, H.E.I.C.S., F.R.S.E., M.R. Dublin Society.’

‘Remarks upon British Plants; by Charles C. Babington, M.A., F.R.S., F.L.S., &c.’

‘On the Genera of the Tribe Duboisæ; by John Miers, Esq., F.R.S., F.L.S.’

‘On the Nervures of Leaves and their Distribution; by L. von

Buch.' [Extracted from the Bibl. Univ. de Genève, Oct. 1852, p. 161.]

Mr. Babington's paper is continued from the April number, and contains valuable remarks on certain species of *Hypericum*, *Agrimonia*, and *Matricaria*.

Hypericum.

It will be recollected that a second species of that division of *Hypericum* called *Androsæmum* by some authors, has been introduced into the British Flora, under the name of *H. grandifolium*, *Chois.* Such is the case in Mr. Babington's 'Manual,' in which it is recorded as "stated, doubtless erroneously, to grow in Arran, Scotland." The species is a native of the Azores; and it seems strange that it should re-appear in Scotland, when absent from the climatically intermediate countries. Bertolini, in his recently-published fasciculus, vol. viii. fasc. 3, includes the supposed Arran plant, indeed the whole of the supposed species, *Hypericum grandifolium* of Reichenbach (*Icon. Fl. Germ.* vi. 70, t. 352), under the name of *Hypericum anglicum*; but, unfortunately, as it appears to us, quotes Curtis' figure (*Fl. Lond.* i. t. 164), as representing his plant. Now, that figure certainly represents; and with very considerable fidelity, the *Hypericum Androsæmum* of Linneus. Still, there is a larger, and, as Mr. Babington thinks, a distinct, plant, first gathered by Dr. Balfour at Glanmire, near Cork, in great abundance, and apparently wild: this plant is supposed to be the *H. anglicum* of Bertolini. Amended characters of *H. Androsæmum*, *H. anglicum*, and *H. hircinum* of Linneus, an allied European species, are given as below:—

"1. *H. Androsæmum* (Linn.); stem shrubby compressed, leaves broadly subcordate-ovate blunt, cymes few-flowered, sepals broad unequal, *styles falling much short of the stamens, capsules pulpy blunt.*

"*H. Androsæmum*, *Linn. Sp. Pl.* 1102, et *Auct.*

"2. *H. anglicum* (Bert. ?); stem shrubby 2-edged much branched, pedicels 2-winged, *leaves broadly cordate-ovate acuminate*, cymes few-flowered, sepals ovate-lanceolate unequal, *styles equalling or exceeding the stamens, capsules oblong acute.*

"*H. anglicum*, *Bert. Fl. Ital.* viii. 310 ?

"*H. Androsæmum*, *Eng. Bot.* t. 1225.

"*H. hircinum* (Linn.); stem shrubby 2-edged much branched, pedicels 2-winged, *leaves ovate-oblong*, cymes few-flowered, sepals lanceolate unequal, styles equalling or exceeding the stamens, capsules oblong acute.

"*H. hircinum*, *Linn. Sp. Pl.* 1103 et *Auct.*"

As an observation, perhaps not altogether out of place, I may remark that the St. John's-worts of the division called *Androsæmum* are great favourites in Ireland. No flowering plants are more common in cultivation; none more hardy; and none, as it appears to me, more given to escape, and to ornament the hedge-banks in the vicinity of towns, the only locality in which Irish hedge-banks can be said to exist. It is almost impossible for the traveller not to be struck with the frequency and beauty of these plants in such situations. I do not feel quite so sure that such apparent escapes, after perhaps half a century's cultivation in a very fertile soil, can safely be regarded as having any very strong claim on the botanist's attention. Their original source is lost in obscurity; and their clinging to the confines of cultivation with vigorous pertinacity, and assuming a wild and natural character, is scarcely conclusive evidence of an indigenous origin. The same observation applies to *Hypericum calycinum*, so luxuriantly and abundantly naturalized in the vicinity of Killarney, and other Irish localities.

Agrimonia.

Agrimonia odorata, *Mill.*, introduced into the British Flora on the faith of specimens found by the Rev. W. W. Newbould, in the Island of Jersey, in 1842, was subsequently found by Mr. Babington, in company with that gentleman, on the rocky shore of Lough Neagh, in the North of Ireland, and again by Mr. Joseph Woods, near Start Point, in Devonshire, and near Gwithian, in Cornwall. It may therefore be now fairly received as geographically a British plant; its occurrence in the Channel Islands giving it a political claim only. The italicized words in the following character serve to distinguish it from *A. Eupatoria* :—

"*A. odorata* (Mill.); leaves interruptedly pinnate coarsely serrate hairy and with many minute glands beneath, calyx-tube of the *fruit bell-shaped not furrowed*, exterior spines of the fruit declining.

"*A. odorata*, *Mill. Dict.* n. 3; *Koch, Syn.* 245; *Mert. et Koch, Deutschl. Fl.* iii. 376; *De Cand. Prod.* ii. 587? *C. A. Mey.*

' *Bull. St. Pet.* x. 344,' and *Ann. Soc. Nat.* ser. 2, xviii. 375 ;
Guss. Syn. i. 527 ; *Ledeb. Fl. Ross.* ii. 31.

" *A. procera*, *Wallr. in Linnæa*, xiv. 573."

Matricaria.

Mr. Babington attempts, with great ingenuity, to lay down characters whereby the species *M. inodora* and *M. maritima* may be distinguished. The subject appears to be one of very considerable difficulty ; and British botanists have great reason to thank Mr. Babington for the pains he has taken. Indeed, in this as in all other instances, this excellent botanist investigates the question before him with the utmost care ; and although some may doubt the conclusions at which he occasionally arrives, the zeal, industry, ability, and great knowledge which he brings to bear on every subject under investigation, must be patent to all.

The following are the characters of the species now under consideration :—

- " 1. *M. inodora* (Linn.) ; st. erect, leaves sessile pinnate, leaflets with many usually alternate capillary pointed segments, basal leaflets crowded clasping the stem not separated from the others, heads solitary, phyllaries lanceolate blunt with a fuscous scarious torn margin, fruit with two glandular spots just below the elevated border.
- " *M. inodora*, *Linn. Fl. Suec.* ed. 2, 297 ; *De Cand. Prod.* vi. 52 ; *Fries, Mant.* iii. 115 ; *Hook. and Arn. Brit. Fl.* 242 ; *Gren. et Godr. Fl. Fr.* ii. 149 ; *Lloyd, Fl. Loir-inf.* 139.
- " *Chrysanthemum inodorum*, *Linn. Sp. Pl.* ed. 3, 1253 ; *Koch, Syn.* ed. 2, 419.
- " *Pyrethrum inodorum*, *Sm. Fl. Brit.* ii. 900, and *Eng. Fl.* iii. 452 ; *Eng. Bot.* t. 676.
- " *Tripleurospermum inodorum*, *C. H. Schultz ex Koch, Syn.* ed. 2, 1026 ; *Walp. Rep.* vi. 196.
- " *Chamæmelum inodorum annuum humilius*, foliis obscure virentibus, *Dill. in Raii Syn.*, ed. 3, 186.
- " *β. salina* ; stem more diffuse often nearly prostrate, leaflets short fleshy, involucre umbilicate, disk broader, fruit with only the one external rough space and oblong glandular spots.
- " *M. maritima*, *Linn. Herb.* ! *Gren. et Godr. Fl. Fr.* ii. 149 (excl. syn.)
- " *Pyrethrum inodorum β. salinum*, *Wallr. Sched. Crit.* 485.

" *Pyrethrum maritimum*, *Sm. Fl. Br.* ii. 901, and *Eng. Fl.* iii. 452 ;
Eng. Bot. t. 979 ; *Wilson in Hook. Journ. of Bot.* i. 271.

" *Tripleurospermum maritimum*, *Koch, Syn.* ed. 2, 1026 ?

" 2. *M. maritima* (Linn.) ; stem diffuse, leaves pinnate, leaflets and segments opposite fleshy linear bluntish short, basal leaflets few small separated from the others, heads solitary, phyllaries oblong blunt with a scarious (pale) entire margin, fruit with two elongated glandular spots just below the elevated lobed border.

" *M. maritima*, *Linn. Sp. Pl.* ed. 1, 891, ed. 3, 1256 ; *Fries, Mant.* iii. 115, et *Summa*, 186, et *Herb. Normale*, xii. 2 !

" *Chamæmelum maritimum* perenne humilius, foliis brevibus crassis, obscure virentibus, *Dill. in Raii Syn.* ed. 3, 186, t. 7, f. 1 ; *Linn. Iter. w. Goth.* 148."

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-fifth Sitting.—Saturday, May 28, 1853.

MR. NEWMAN, President, in the chair.

The President read the following communications :—

Hermaphrodite Florets in Salix caprea.

" Amongst my specimens of this species, is a flowering branch, gathered in 1847, on the banks of the Ouse, between York and Acomb, which appears to deserve notice, as exhibiting amongst its catkins a gradual transition from staminate to pistillate inflorescence. The former occurs most plentifully in those situated about the summit of the stem, especially towards their apices ; whilst normal pistils are confined to the base of the lowest catkin. The scales remain unaltered throughout, and are as in the ordinary state of the species. Between the extreme conditions of the essential portion of the flowers, four principal intermediate stages may be traced, leaving out numerous minor gradations.

" 1. Filament as in the normal stamen ; anthers smaller, placed upon a dilated connective, which is slightly produced beyond them, like a beak.

"2. Filament shorter, stouter, slightly silky; connective transformed into a cernuous ovarium-like body, shaped like the capsule of some of the Hypna, with faint traces of anthers upon its sides; beak dilated into the resemblance of a stigma.

"3. Stalk filament-like; ovary narrowly lanceolate, gray, silky, curved; stigma sessile, irregular, but viscid.

"4. Stalk rather longer than in the normal pistil; ovary gray, silky, flask-shaped; style very short; stigmas perfect, somewhat emarginate."—*John G. Baker; Thirsk, near Yorkshire, May 7, 1853.*

Rubus latifolius, Bab.

"Whilst Rubi are under consideration, perhaps I may be allowed to suggest the idea that this supposed new species, described in the third edition of the 'Manual,' is a luxuriantly-developed form of *R. corylifolius*, bearing the same relation to the type that var. *pseudo-Idæus* bears to *R. cæsius*, or *R. Borreri*, *Bell-Salter*, to *R. Sprengelii*, *Weihe* (see Phytol. iv. 917, 918). It is recorded in the Supplement to the 'Cybele' as a native of the Humber province, on faith of specimens collected in the hedges between Thirsk and the village of Thorpfield; so that I have had an excellent opportunity for studying it in a growing state. In the extreme form, in this neighbourhood, it is a large, coarse-looking bramble, rivalling *R. Balfourianus* or *R. macroacanthus* in size, with a thick, furrowed, and angular barren stem, green in the shade, but purplish and glabrous, like that of the *Nitidi*, when exposed. The leaflets are exceedingly dilated, and consequently much imbricated; the terminal one rotundato-cordate, acuminate, even occasionally broader than long, and pilose beneath, as described. But gradually and imperceptibly, as we pass along, the stem becomes more slender and less angular, the prickles smaller, and the leaflets narrower and thicker in texture; and without any abrupt transition we arrive at the '*conjungens*' form of *R. corylifolius*; this, again, gliding into the type of the species, with its characteristic, round, and slightly setose stem, slender and somewhat irregular prickles, and leaves whitish and tomentose below."—*Id.*

Rubi in the North of England.

"Probably nearly all the fruticose forms will be found to extend their range to the north of the Humber; thirty out of thirty-eight species described in the third edition of the 'Manual' having already been detected by very imperfect research. In North Yorkshire, the commoner species, arranged in their order of frequency, are discolor,

cæsius, corylifolius, pallidus, tenuiarmatus, *Lees*, rhamnifolius, leucostachys, fusco-ater, mucronatus, Koehleri, nitidus, and rudis. The rarer are suberectus, plicatus, affinis, thyrsioideus, carpinifolius, villi-caulis, macrophyllus, Sprengelii, fuscus, Babingtonii, hystrix, Guntheri, glandulosus (Bellardi and rosaceus), and nemorosus. The thyrsifloral form of *R. Guntheri* (*R. thyrsiflorus*, *Lees in Steele's Handbook*) occurs, with the type of the species, amongst the rocks above Gormire. In this latitude, the fruticose species cease to become plentiful, in exposed positions, at 800 or 900 feet, though stragglers may occur much higher. They are replaced, in more elevated situations, by *R. saxatilis*, and, on the boggy surface of the higher moors, by *R. Chamæmorus*."—*Id.*

Polygala uliginosa, Reich.

"In the last number of the 'Phytologist' (iv. 940), this recent addition to our lists is incidentally mentioned as having been discovered in Scotland. The only locality yet ascertained is on heathy ground along the margin of the rivulet behind Cronkley Fell, in the *Yorkshire* portion of Upper *Teesdale*, at an elevation of about 1600 feet, more or less."—*Id.*

Worcestershire Species of Lepidium.

"All the British species of *Lepidium* are now found near Worcester, although Purton, in 1821, records only one in the midland counties, *viz.*, *L. campestre*, which is still the only common species in this neighbourhood. *L. ruderale*, however, had been mentioned by Withering, in 1787, on the authority of Dr. Stokes, as growing upon 'rubbish on the side of the Severn above Worcester;' and during the last few years it has been observed in three other places, to the north of the city. Last autumn, it was very abundant in a lane near St. Peter's Church, Droitwich, in the locality where I discovered it two years ago, on rather elevated ground, in company with *Spergularia marina*, *Poa distans*, *Glaux maritima*, and other maritime plants. *L. Smithii*, though rare, is occasionally met with near Mavern and Worcester. *L. Draba* maintains its singular position at the Powick-bridge embankment, on the Malvern road, where it was first discovered in 1843, by E. Lees, Esq., who has contributed more than any other individual towards the advancement of our knowledge of Worcestershire plants. *L. sativum* is occasionally met with about Worcester, and elsewhere in the county; and it seems pretty well naturalized, though doubtless a garden escape. Last October, I had

the pleasure of adding to the Worcestershire Flora, *L. latifolium*, which I found close to the river Salwarp, where it is crossed by the Wolverhampton Railway, near Droitwich. I first saw some patches of it on the recently-formed railway embankment; but on further examination I detected some old plants in a muddy place by the river-side, where, perhaps, they have been growing secluded and unnoticed for a long time. *L. latifolium* is not quite unknown in this western part of the island; for I met with it last July, in some quantity, near Britton Ferry, in Glamorganshire, where it has been observed for years. But I am not aware of its having been recorded as an inland plant; and it is further interesting as another addition to the score of salt-marsh plants which now flourish in the Salwarp Valley, perhaps the relics of an acient marine vegetation, as Professor Buckman suggests in his 'Ancient Straits of Malvern.'—*J. H. Thompson, B.A.; St. Nicholas, Worcester, May 4, 1853.*

Epilobium virgatum.

“Mr. Syme having intimated his belief (Phytol. iv. 933) that the plant sent by me to the Botanical Society as *Epilobium virgatum* should rather have been labelled *E. Lamyi*, it may perhaps be satisfactory to the members to know that I used that name on Mr. Babington's authority, having submitted specimens of the Herefordshire plant to him. It is thus undoubtedly the *E. virgatum* of the 'Manual,' and, as it appears to me, of continental botanists also; seeing that *E. Lamyi* is stated by Godron, in the 'Flore de France,' to have no stolons; while in many of the examples I sent to the Society they are three or four inches long, as is stated to be the case in *E. virgatum*. I have a specimen with broad-based, decurrent leaves, and no stolons, gathered in Kincardineshire, by Mr. Syme, in 1850, and sent to me by the Botanical Society, as *E. virgatum*. This specimen Mr. Babington pronounced *E. tetragonum*; and if it is identical with the Scotch plant spoken of by Mr. Syme, the cause of our different nomenclature is at once apparent. Mr. Babington's *E. tetragonum* is so scarce in this neighbourhood, that I have not been able to study it sufficiently to warrant me in expressing any opinion as to the constancy of its differences from *E. virgatum*.”—*W. H. Purchas; Ross, May 21, 1853.*

Remarks upon Polystichum aculeatum.

“A very general opinion prevails that *Polystichum angulare* and *P. Lonchitis* are connected together by a series of forms of *P. aculeatum*,

scarcely differing from them at the two extremes, or from each other in their intermediate links. I have paid considerable attention to *P. aculeatum* and its supposed varieties for upwards of ten years; and I now believe that the plant has no constant variety whatever.

“In the month of May, 1842, I took up a plant of this species in the neighbourhood of Egham. It had fronds about a foot long, and was a good representation of what botanists call var. *lobatum*. This was planted in a bed of bog-soil, which had been purposely prepared for ferns, in a rather exposed situation. It kept its character (or, rather, retrograded) for three years. In 1845, the whole of the ferns in this bed were removed to another place, where the natural soil was light, the subsoil gravel, and the situation shady. Here our plant soon found itself at home, and in three years attained as high a state of development as I have ever observed in any plant of this species; it then became stationary, and remains so up to the present time. I have now before me a frond of it, of last year's growth, nearly three feet long by somewhat more than six inches broad. The pinnules are distinctly stalked for more than two-thirds of the length of the pinnæ. In this state, it comes near to *P. angulare*, but differs from that species in its more rigid texture, narrower outline of frond, more crowded pinnæ, more acute, strictly serrate pinnules, and in its never becoming subtripinnate, which fronds of *P. angulare*, of two feet long or more, invariably do. I have observed another difference between these plants, which (to the best of my knowledge) has not been recorded by any botanist. *P. angulare* is very proliferous, producing lateral crowns freely; whereas *P. aculeatum* never does, except when its crown gets destroyed by accident, and then it will. In the spring of 1852, I took up a plant with four crowns, in various stages of development, from *lonchitidioides* to *lobatum*. Near as these two species are to each other, there are two acknowledged species between them, or, rather, placed opposite to their point of junction; I mean *P. pungens* and *P. proliferum*. Both are as rigid as *P. Lonchitis*; and whilst the former has the broad, subtripinnate frond of *P. angulare*, the latter has the narrower frond and decurrent lobes of *P. aculeatum*; it is, also, viviparous near the apex of the frond, but not constantly so.

“Nine years since, I collected about a dozen plants upon a dry bank. They could scarcely be called more than pinnate; and I thought I had got var. *lonchitidioides*. One of these I potted, and kept in a greenhouse; and in three years it came to the same state of development as the plant first mentioned was when I first saw it.

I then turned it into a border, with other ferns, and kept it two more years; and it still kept getting nearer to its full state of development.

"I think that the above examples are sufficient to trace this species in its transition from its young state to its full development; but they are only two amongst many.

"If a young plant of this species is planted in an unfavourable situation, it will remain stationary for years, or perhaps get less divided than when first planted, but will always advance if properly treated. In its wild state, it is very generally distributed, and may probably be found in every English county. It appears to like a loamy, or even a clay, soil; its favourite situation is a steep bank in a shady lane; and it is generally associated with *P. angulare*, and often with *Scolopendrium vulgare* also. It does not transplant from its wild state so well as its congener, being not so tufted, and more wiry, as well as longer in its roots. When it has established itself under cultivation, that character is not so easily observed; but it is very apparent in removing wild plants.

"It may be mentioned, with respect to its distribution in the vicinity of London, that in Surrey you seldom meet with many plants together, and that it is much scarcer than *P. angulare*; whilst on the opposite side of the Thames, in Middlesex, and particularly in Buckinghamshire, it is by far the most plentiful plant; and in Kent and Sussex the two appear to be about equal.

"I inclose the frond first mentioned; a frond from the same plant ten years ago; a small frond from the plant with four crowns, which were produced since it was transplanted in May, 1852; and the plant itself, taken up and dried, showing the old caudex and young crowns; so that any one who examines them may judge for himself. They are very unlike each other, and amply confirm Mr. Newman's observation that this is a protean fern."—*John Lloyd; Wandsworth.*

Gymnogramma leptophylla in Jersey.

The President observed that he had received several communications respecting the occurrence of *Gymnogramma leptophylla* in Jersey. All those from the island represent this fern as widely distributed, growing on the banks of exposed lanes having a southern aspect, more especially in those localities in which the moistened soil induces the growth of *Marchantia*, in the company of which plant it appears particularly to flourish; it also occurs, but not so frequently, growing in moss. The principal localities are near St. Haule, near

St. Aubin's, and in several places near St. Lawrence. In one spot near the last-named place, it grows plentifully for a very considerable distance along a hedge-bank, extending as far as the bank is exposed, but ceasing exactly where the lane is shaded by trees. The accounts tend to establish the plant as a true native of the island, and to remove the idea of its intentional introduction.

Pseudathyrium alpestre, and an allied Species.

The President observed that since he had the pleasure of inviting attention to the occurrence, in Scotland, of a fern previously unrecorded as British, several very ardent and most acute botanists had searched the districts indicated, and with complete success. The result, however, was the discovery of, not a *single* species alone, but of two. Through the kindness of Mr. Backhouse, he had had the opportunity of examining an extensive and very beautiful series of each of these; and although in this early stage of the inquiry he by no means wished to do more than indicate the more obvious distinguishing characters, he considered it due to his friends to communicate to the public the result of their researches.

P. alpestre. Habit *rigid*. Frond *lanceolate, suberect*, 2-3 feet long, bipinnate; pinnæ *ascending*, distant near the base, *elsewhere crowded*, subacute; pinnules 25-35 on each side of midrib of pinna, *wider* at base, *crowded*, toothed; clusters of capsules 25 or more on each pinnule, *crowded, finally confluent*.

Hab. "Canlochen Glen, Forfarshire," "Ben Aulder," "Mountains near Dalwhinnie," *H. C. Watson*. "Lochnagar," "Head of Glen Prosen, Clova mountains, Forfarshire," "Ravine of the White Water, Clova mountains, Forfarshire," "Glen Fiahd, Clova mountains," *James Backhouse, James Backhouse, junr., Thomas Westcombe*.

P. flexile. Habit *lax, flexile*. Frond *strap-shaped*, spreading horizontally, 8-18 inches long, bipinnate; pinnæ *distant throughout, horizontal or drooping*, subobtusely; pinnules 7-10 on each side of midrib of pinna, *narrower at base, distant*, subobtusely, serrated; clusters of capsules 6-8 on each pinnule, *distant, always separate*.

Hab. "Micaceous rocks at the head of Glen Prosen, Clova mountains, Forfarshire," *James Backhouse, James Backhouse, junr., Thomas Westcombe*.

The generic characters assigned to *Pseudathyrium* will require revision. From an examination of fronds of "*P. alpestre*" in a living state, it seems that the clusters of capsules first make their appearance with a crescentic margin of attachment, somewhat as in *Athyrium Filix-fœmina*; and that there exists occasionally a rudimentary involucre scale. The same crescentic margin of attachment has been observed by Mr. Backhouse in the cultivated living frond of the plant now called "*P. flexile*." The specific characters will also require remodelling; and a rigid investigation of the synonymy is absolutely necessary, the names now proposed being provisional only, the latter, more especially, being likely to be superseded by a prior specific name.

THE PHYTOLOGICAL CLUB,
(*In connexion with the Pharmaceutical Society*).

May 2, 1853.—Robert Bentley, Esq., F.L.S., &c., President, in the chair.

Several new members joined the Club.

Mr. D. Hanbury exhibited the following specimens:—

1. Ravensara nuts, produce of *Agathophyllum aromaticum*, a tree of Madagascar, where they are used as a spice, and whence they have occasionally been brought to France.

2. *Casca pretiosa*, the bark of *Mespilodaphne pretiosa*, a native of Brazil. It is highly valued as an aromatic. It belongs to the natural order Laurineæ.

Worcester Branch of the Club.

The Secretary presented a report of a meeting of the members of the Club, resident at Worcester, held April 22, when the "*Worcester Branch of the Phytological Club*" was formed. A few simple rules were adopted, providing for periodical meetings, herborizing excursions, the formation of a local herbarium of plants found in the county, &c. A standing note was appended to the Rules, to the effect that members be exhorted to be particularly observant of Professor Bentley's truthful remarks on the destruction of habitats for scarce plants, *viz.*, never to allow their love of *collecting* to supersede their love of *Botany*. Considering the assistance that more experienced botanists of the neighbourhood could give in the formation of a county herba-

rium, it was resolved "that Edwin Lees, Esq., F.L.S., the Rev. J. H. Thompson, and T. Westcombe, Esq., be invited to become Honorary Members." The commencement of a library was proposed; and a few books were presented for this object. Mr. J. S. Walker, Mr. Baxter, and Mr. T. W. Gissing were appointed the Committee; Mr. Walker to be Chairman; and Mr. Gissing, Secretary.

Uses of Ferns.

The Secretary read a letter from E. Newman, Esq., F.L.S., &c., asking information upon the *uses* of ferns throughout the country, for the forthcoming edition of his 'British Ferns.'

Mr. Newman inquires:—

"1st. Are there any species of British ferns used in medicine?"

"2nd. Which *species*, and under what *names*? On this subject, three provincial chemists have assured me that Polypodium vulgare of botanists is the P. Filix-mas of pharmacy; and I have verified this nomenclature in one instance.

"3rd. Whether the use of ferns in medicine is founded on their ascertained properties, or on ancient predilections?"

"4th. Whether the use is increasing or decreasing?"

"This and all other information connected with British ferns will be most thankfully received by yours, most truly,

"Edward Newman."

The President hoped that the queries just read would elicit the response they deserved. A wide field of usefulness lay open to the Club, in collecting statistics of the popular employment of native plants in different parts of the country. Mr. Newman's second query showed that confusion of species had in some instances occurred. However, the true *Lastrea Filix-mas* was certainly in use.

Two or three members spoke of the employment of *Ophioglossum vulgatum* for the preparation of a very popular ointment, in the counties of Essex, Herts, and Devon, from their personal knowledge.

A letter was also read from Dr. William Lauder Lindsay, F.B.S.E., &c., of Edinburgh, who wished to obtain co-operation in an investigation of the lichens, which he had undertaken. The letter was accompanied by a *resumé* of the points upon which information was desired.

Ergotism of Grasses.

Mr. Blyth drew attention to the subject of the ergotism of grasses. During the summer of last year, he had observed its prevalence amongst every species of grass, in certain localities. These were upon a heavy clay soil, and on the shady sides of hedges.

It would be remembered that the cold and dry spring, which retarded vegetation, was succeeded by heavy rains at the period of inflorescence of the cereals, and then by intense heat.

Specimens of ergot, collected from a number of grasses, were placed on the table. Some of the same sample had been employed by Dr. Tyler Smith, at St. Mary's Hospital, and had proved far more efficient than the ergot of rye. The question of its substitution was therefore one of much interest; and it was most desirable that any opportunities for its collection should be embraced, in order to place in the hands of the medical profession a supply for further examination.

The influences upon which the disease depended were still a contested subject; and it was to be hoped that the simultaneous observations of pharmacutists in different parts of the country, during the ensuing season, would assist in clearing up some points involved.

It would be important to notice the character of the soil, the temperature of the air, the amount of rain, and the periods of vegetation at which it had fallen; also whether sunshine had prevailed.*

Substitute for Tea, &c.

The President exhibited some specimens received from Capt. Kennedy, late commander of the 'Prince Albert,' one of the vessels engaged in the search after Sir John Franklin.

Firstly, the dried flowers, with a few leaves, of *Ledum palustre* (Ericaceæ), employed extensively as a substitute for tea, in various parts of North America. The plant in question is commonly called narrow-leaved Labrador tea, and is an inhabitant of the colder part of Canada, the coasts of Newfoundland and Labrador, and the whole of Rupert's Land to the Arctic Sea, on whose shores it grows, from Repulse Bay to Kotzebue Sound. According to Dr. Asa Gray, it is not found South of the United States boundary-line. This plant was formerly found on the north-west coast of Ireland, and used to be included in

* An excellent popular account of the subject will be found in a little book entitled 'Blights in the Wheat,' by the Rev. E. Sydney. Religious Tract Society.

the lists of the British Flora ; but it is now very properly omitted, as having no claim to be considered native. An infusion of the flowers and leaves possessed an astringent, bitter flavour, and a strong, somewhat aromatic odour. It certainly appeared to produce a slight narcotic effect, which is not surprising, when its alliance to the Rhododendrons, Kalmnia, Azalea, &c., all possessing poisonous narcotic qualities, is considered. The leaves are stated to be used in the preparation of beer, which they render extremely heady. Two other plants of the same natural order, *Gualtheria procumbens* and *Rhododendron Lapponicum*, are in use in North America as substitutes for tea.

Pemican, an article of Arctic diet, composed of buffalo-meat mixed with marrow and the fruit of some tree, was introduced on account of the latter ingredient. This fruit is a small, black pome, nearly agreeing with the Zante currant in size and flavour. Sir J. Richardson, in his 'Journal of a Boat Voyage through Rupert's Land,' states that two fruits are used for mixing with pemican, *viz.*, choke-berry (*Cerasus Virginiana*) and shad-berry, or service-berry (*Amelanchier Canadensis*). The fruits, then, under consideration, were evidently derived from the last-named.

Medicinal Lobelia, from Peru.

Mr. D. Hanbury read the following paper, 'On a Variety of Lobelia, from Peru, having Medicinal Properties,' by Mr. Penney, who was unavoidably absent :—

"A few weeks since, Mr. Daniel Hanbury handed me a specimen of Lobelia, which he had received from Mr. A. J. de Warszewicz, a German botanist, travelling in South America. It was found near the village of Jarobamba, five leagues from Arequipa, in the district of Canchumia, Peru. It is evidently a Lobelia, agreeing in its characters with that genus. A monopetalous, epigynous exogen, with a two-celled ovary, syngenesious anthers, stigma surrounded by hairs, and valvate, irregular corolla, it is at once recognized as belonging to the family Lobeliaceæ. I have carefully examined it, and compared its characters with De Candolle's description of the Lobeliæ, and have no doubt of its being the *Lobelia decurrens*, var. β ., of that author, described in his 'Prodromus,' part vii. p. 384. The *L. decurrens* is described and figured by Cavanilles, in his 'Icones et Descriptiones Plantarum quæ aut sponte in Hispania crescunt aut in hortis hospitantur,' tom. vi. p. 13, t. 521 ; also in the Bot. Reg. vol. xxii. tab. 1842.

"This variety, under the name of *Lobelia foliosa*, was noticed by Bonpland in 1808. It agreed with Cavanilles' plate, except that the lobes of the calyx and the tube of the corolla are externally pubescent: the leaves and the lobes of the calyx and corolla are very similar. It is described in the 'Nova Genera et Species Plantarum Americanarum' of A. Bonpland, A. de Humboldt, and C. S. Kunth, tom. iii. p. 242. Cavanilles and De Candolles both give the habitat of the *L. decurrens* in Chili, on the banks of the river Claro. Kunth says this variety grows in Quito, near the village of Guancabamba. Bonpland gives Peru as its habitat. Mr. de Warszewicz states that it grows on the river Arequipa. These two varieties are included, but not described, by Presl, in his 'Prodromus Monographiæ Lobeliacearum,' p. 24, under the names *Rapuntium decurrens* et *foliosum*.

"Like other Lobeliaceous plants, this plant is very acrid; its aqueous infusion has a burning, acrid taste, not unlike tobacco; and its smell is irritating and nauseating. It is used as a medicine by the natives of Peru. Mr. de Warszewicz says that its action is very remarkable in nervous fever; that the leaves and flowers, given at Arequipa in the form of powder, in the dose of one, two, or three grains to adults, are found quickly to change the symptoms of the patient; that it is very active as an emetic and purgative; and that the Indians universally employ it as an emetic. He thinks it might be used here as a substitute for *Ipecacuanha*. The roots, which are from four to eight feet in length, are used as well as the flowers and leaves. Mr. de W. is very desirous that its effects should be tried in this country, and hopes that it may prove a more important addition to the *Materia Medica* than the *L. syphilitica*. He says that it may be obtained in large quantities from Mr. Harmson, of Arequipa."

Mr. J. J. Muskett read an interesting paper 'On the Phytology of the Middle Ages,' referring more especially to superstitions attaching to plants, and to the adaptation of vegetable forms to architecture and heraldry. The essay was illustrated by numerous drawings, rubbings of monumental crosses, &c.—*R. R.*

Obituary.—Died, at Leipzig, on the 2nd of May, Professor Dr. Ch. F. Schwaegrichen, the Nestor of Muscology.—*Bonplandia*.

Botanical News.—Italy.

Florence, April 24.—The reports and documents relating to the Horticultural Exhibition that took place in Florence, in September last (see *Bonpl.* vol. i. p. 43), have been published; also a Prospectus of the Horticultural Society which those who got up the exhibition hope to be able to form. The seat of the Society is to be in Florence; and to become a member it is necessary to take one share or more, of three francesconi (13s. 4d.) a year each, and, moreover, to pay an entrance-fee of one francesconi. Two hundred shares have already been disposed of.

We have received two new memoirs by M. Gasparrini, published in the 'Transactions of the Academy of Naples.' The one is a 'Revisio Generis Trigonellæ.' The author raises the sections established by Seringe, in De Candolle's 'Prodromus,' to the rank of genera, under the names of *Grammocarpus*, *Ser.*, *Xiphostylis* (*Fœnum græcum*, *Tourn.*), *Falcatula*, *Brot.*; the name of *Trigonella* being retained for the section *Buceras*, *Ser.* The other memoir contains now observations on the fecundation and embryo of *Cytinus Hypocistis*,—a subject investigated by the author eight years ago, and concerning which he now expresses an opinion decidedly opposed to Schleiden's theory on fecundation. According to him, the embryo of this plant is not derived from the transformation of the extremity of the pollen-tube, but, on the contrary, from one or more vesicle of the summit of the internal nucleus (or sac of the embryo), which are developed before fecundation. Prof. Tenore has written a dissertation on some trees mentioned by the writers of the middle ages, such as the *Arbor vitæ* (*Thuja orientalis*), the balsam-tree (*Amyris Opobalsamum*), the dry-tree (*Platanus orientalis*), the tree of the sun and the moon (*Cupressus sempervirens*), &c. Prof. Massalongo, of Verona, has published an enumeration of the miocene fossil plants hitherto known in Italy; they are sixty-two in number. According to the author, the number of species belonging to the Italian fossil Flora amounts to nearly 1000.

Mr. Webb returned from Rome to Florence a few days ago. Prof. Joseph Bertoloni was also on a visit here a short time ago, for the purpose of studying the plants sent him from the coast of Mozambique, especially those distinguished by useful or otherwise remarkable properties.—*Bonplandia.*

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-sixth Sitting.—Saturday, June 25, 1853.

MR. NEWMAN, President, in the chair.

The President read the following communications:—

Potamogeton flabellatus, Bab.

“On the 30th of May last, I found this plant in a fen-ditch near Nordelph, Norfolk. This may be worth recording, as the plant is very little known, although probably not very uncommon. No botanist, who has examined and compared the earlier leaves of this plant and *P. pectinatus*, can, I think, have any doubt concerning their distinctness. When those leaves are wanting, as is usually the case when the plant is in fruit, it is often very difficult to distinguish these species.”—*C. C. Babington* ; June, 1853.

Potamogeton prælongus, Wulf.

“On May 30, 1853, I saw this plant in the river called Well Creek, near Nordelph, in the fens of Norfolk. As this is a comparatively new plant, the fact may be worth recording.”—*Id.*

Udora Canadensis.

“Hitherto, Worcestershire and Gloucestershire have been exempt from the inroads of the *Udora* ; but it appears that the insidious floater is fast approaching, as I have just received a letter from a botanical friend at Stratford-on-Avon (Mr. W. Cheshire, jun.), with specimens ; in which he informs me that the plant has suddenly appeared in the river Avon, at that place. He has perceived and gathered it, this month, both above and below the town, as well as in ditches near the bridge at Stratford, and, from his familiarity with the river, and often boating upon it, is confident it was *not there last year*. Now he finds it in the very bay where the boat is moored, ‘every inch of the water’ about which, he says, was familiar to him. The plants, though numerous, are mostly small, four or five inches in length, and at present barren. He suggests, what I think is very likely, that the winter floods, which were numerous and of long continuance,

floated the Udora down from Rugby, in the vicinity of which it flourished, and have thus established it at Stratford ; but the rapidity of its growth in one season seems astonishing. I shall now watch its advent down the Avon into Worcestershire ; but hitherto, though I saw a friend from near Eckington yesterday, it has not been reported. The ‘soft-flowing Avon’ is so still a river, that I fear the Udora will become as great a nuisance there as in Cambridgeshire. My friend says we shall be sure to have it soon, as boats, in passing, break off the brittle stems, thus leaving it to float with the current.”—*Edwin Lees ; Cedar Terrace, Henwick, Worcester, June 17, 1853.*

Gymnostomum tenue in Yorkshire.

“I take the liberty of sending you a few specimens of *Gymnostomum tenue*, gathered by me, a few days since, from the ruins of the Abbot’s House, Fountain’s Abbey, Yorkshire. It may perhaps interest some of the readers of the ‘Phytologist’ to know that this comparatively rare moss grows and fruits abundantly at the above-mentioned place.”—*Arthur Hutchinson ; Bury, Lancashire, June 15, 1853.*

Claytonia perfoliata.

The President called the attention of the Club to the rapid increase of this North-American plant. The cause of its introduction into this country, he said, did not seem very obvious ; but, owing to the abundance of its seeding, the facility with which the seeds germinate, and the adaptability of the plant to our climate, it bid fair to become as thoroughly naturalized as any plant of Transatlantic origin. No one would presume to call in question its exotic origin ; but, in after years, it would probably take its station, by the side of *Senecio vulgaris* and *Capsella Bursa-pastoris*, as a common garden weed. This pretty plant was well known to Loudon, who notices its good qualities as a vegetable,—a statement fully confirmed by Mr. Pamplin and others. Mr. Thomas Corder records (*Phytol.* iv. 485) that it grows, in yearly increasing abundance, in the vicinity of Ampthill ; and that he cannot learn of its ever having been cultivated in the neighbourhood where it is found ; and Mr. Reynolds states that Mr. Corder has sent a supply of specimens, gathered during the present year, for distribution among the members of the Phytological Club. Mr. John Hutchinson has found it this year, growing in great abundance among chickweed, and apparently perfectly established, at Weybridge, in Surrey ; and here the plants are of great size and luxuriance. The late Mr. Anderson introduced the *Claytonia* into the Botanic Garden

at Chelsea, where it soon became a most troublesome weed, and remains so at the present day, coming up spontaneously, by thousands, in various parts of the garden. Mr. Anderson gave specimens to the late Mr. Pamplin, of Lavender Hill; and here, again, its usual propensity to increase was strongly developed. During the present summer, it has appeared on and near Clapham Common, and also at Peckham, coming up spontaneously in Mr. Newman's garden. A remarkably good figure, and a good account of the plant, are to be found in Baxter's 'British Flowering Plants,' vol. iv. p. 253. It affords, as pointed out by Mr. Pamplin, admirable examples of two different forms of leaves: *spathulate*, as in the radical leaves; and *perfoliate*, as in the stem-leaves.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, April 14, 1853.—Professor Balfour, President, in the chair.

The following donations were announced to the Society's library and herbarium:—'Report of Select Committee on Morton's Memorial to Congress, anent the Discovery of the Anæsthetic Properties of Sulphuric Ether,' from Dr. W. T. G. Morton; a large parcel of rare Irish plants, for the Society's herbarium, and for distribution, including *Trichomanes radicans*, *Hypericum anglicum*, &c., from Mr. Sibbald; and specimens of *Arundo stricta*, from the shores of Lough Neagh, Antrim, from Mr. C. C. Babington.

Dr. Balfour laid upon the table a Prospectus of Dr. George Johnston's 'Natural History of the Eastern Borders.'

Dr. Balfour mentioned that letters had been received from Mr. J. A. Jeffrey, horticultural collector in Oregon, dated Oregon, January 22, 1853, and Columbia City, February 15, 1853, announcing the despatch of two packages (Nos. 5 and 6) of Coniferæ and other seeds, from the Californian district, &c. Among them are seeds of *Picea nobilis* and *P. grandis*, *Abies Pattoniana*, *Pinus Lambertiana*, *P. monticola*, *P. ponderosa*, *P. macrocarpa*, several unnamed species of *Pinus*, *Cupressus*, and *Juniperus*, besides many other trees, shrubs, and herbaceous plants.

Professor Balfour exhibited the following donations, made to the Museum of Economic Botany at the Royal Botanic Garden since the last meeting of the Society:—From Professor Fleming, New College, Edinburgh: Specimen of a *Lepidodendron*, from Hailes Quarry, near

Edinburgh. From W. L. Lindsay, M.D.: Eighty-two specimens of dyes, manufactured from various lichens.

New Species of Caulerpa.

A paper by R. K. Greville, LL.D., 'On New Species of Caulerpa,' was read.

The author made some introductory remarks on the family of Caulerpeæ, which has been placed near Vaucherieæ; although it has scarcely any affinity with the latter family. Caulerpeæ apparently occupy a place among the Algæ; but their relations do not appear to be determined. The plants grow between high and low water, sending their roots into the sand. They are of a grass-green colour, tough, flat or cylindrical, spreading on the sand by means of surculi, and rooting as they go on, sending down tufts, which resemble in appearance the roots of grasses. The plants have no continuous cavity inside. Their interior is composed of large, anastomosing fibres, with granules and an enormous quantity of starch-grains. Their fructification has been described and figured by Montaigne, in the 'Annales des Sciences Naturelles,' tom. ix. The spores are described as ciliated, like those of Vaucheria. Dr. Greville made remarks on the different species of the genus Caulerpa; and he described the following new species:—*Caulerpa asplenoides* (from St. Thomas's, West Indies), *C. laxa*, and *C. fissidentoides* (from Wright's East Indian collection). The paper was illustrated by specimens and drawings.

Myosotis alpestris, Thymus Serpyllum, and T. Chamædrys.

The third part of Mr. C. C. Babington's paper, intituled 'Remarks on British Plants,' was read.

The author first noticed *Myosotis alpestris* of Schmidt, which he now considers to be identical with *M. suaveolens* of Kitabel, and not, as conjectured by him in his 'Manual,' a mere mountain variety of *M. sylvatica*. *M. alpestris* is distinguished from *M. sylvatica* by the attenuated base of the calyx, and the absence of a keel in the fruit. He next alluded to the British species of *Thymus*. There are two British species, he stated, included under the name of *Thymus Serpyllum*; one being the true species; and the other, the *Thymus Chamædrys*. They are distinguished chiefly by their habit, and therefore require to be in a growing state in order to be satisfactorily determined. In *T. Serpyllum*, there is a difference between the flowering shoot and that which is intended to extend the plant. Quite prostrate and rooting shoots are produced each year, which grow from the end of the

shoots of the preceding year, and do not flower; also, there spring from the other axils of these old prostrate parts of the plant, short erect or ascending shoots, which form a linear series, and each of which terminates in a capitate spike, consisting of a very few whorls, and which die back to the base after the seed has fallen. The growing shoot is perennial, but the flowering shoot is annual. In *T. Chamædrys*, there is no such manifest separation between the flowering and growing shoots. The terminal bud often produces the strongest shoot, which itself ends in flowers, differing thus from the terminal shoot of *T. Serpyllum*, which always produces a flowerless shoot. It wants the regularity of *T. Serpyllum*, and presents a dense, irregular, mass of leafy shoots and flowers intermixed. The two species are thus characterized:—

Thymus Serpyllum, L. Stem prostrate, creeping; leaves oblong or lanceolate, narrowed into the flat, fringed stalk; floral leaves similar; flowering shoots ascending; flowers capitate; upper lip of calyx with 3 short, triangular teeth; lower lip of 2 subulate teeth; upper lip of the corolla oblong.

Thymus Chamædrys, L. Stem similar, diffuse, ascending, bi- or quadrifariously hairy; leaves broadly ovate, with a flat, winged stalk; flowers whorled and capitate; upper lip of the calyx with three triangular teeth; lower lip of 2 subulate teeth; upper lip of the corolla semicircular.

Tour in the Hartz Mountains.

The first part of a paper intituled ‘Notes of a Tour in the Hartz Mountains,’ by W. L. Lindsay, M.D., was read.

The author stated that, with the intention of making a pedestrian tour, for mineralogical and botanical purposes, through the Hartz mountains, he left Holstein (where he had been residing a few weeks, engaged chiefly in botanical and geological excursions) on the 23rd of August, 1850, crossing the Elbe, from Hamburg to Haarbùrg (in the kingdom of Hanover), and proceeding next morning, by rail, to Brunswick and Hartzburg, at the foot of the Brocken. On the evening of the 23rd he made the ascent of the Brocken, the weather being very wet, misty, and cold, and passed the night in the ‘Brocken-haus,’ a rude hôtel, perched on the summit of the mountain, at an elevation of 3500 feet above the sea. “The districts of Hanover and Brunswick, which are part of the great North-German plain, consist, in great measure, of a series of sand-dunes and sandy heaths, marshes

and peat-bogs, meadows and pastures, here and there interspersed with fertile fields and belts of wood. Their Flora, like their geological structure, greatly resembles that of Holstein; the predominant types of vegetation being marsh, meadow, heath, wood, and sand plants. Among vegetables, cultivated to a considerable extent in the more fertile parts of the country, besides the different cereals, pulse, and potatoes, are tobacco, hops, rape-seed, flax, and chicory. Grain is chiefly raised in the neighbourhood of Brunswick, the most fertile part of the duchy of that name. The whole of Hanover and Brunswick appears to have been long submerged by the German Ocean, judging from their geological structure. Probably no tract of land in Europe, of equal extent, can boast of a less degree of fertility; and we do not speak exaggeratingly when we say that, were it exposed to a very hot and dry tropical climate, instead of a very humid, temperate one, it would more or less resemble in character the great African 'Sahara.' Here, as in Britain, and, indeed, throughout Europe, there is a large amount of *waste* land, *i. e.*, flat land easily susceptible of cultivation, which, instead of being devoted to agriculture and the maintenance of man, is set apart exclusively for the purpose of harbouring and protecting *game*! Were such land placed upon the same footing, with regard to free cultivation, as the prairies of Texas or Australia,—were it leased or sold, at moderate rates, to the peasant farmer or artisan,—we cannot doubt that it would not only soon attain a comparatively high state of cultivation, and consequently increase materially in value, but would supply an honourable and profitable field of labour to thousands of our surplus population, who are at present compelled to emigrate beyond the seas. It must be very poor land indeed which cannot be made, by the ingenuity of man, suitable for the growth of vegetables immediately useful to him or the lower animals. Is it not, therefore, unjust, as well as ungenerous, that the noblest inhabitants of our earth should be set aside for the pleasures or prejudices of the aristocrat! As seen from the plains of Brunswick, the Hartz range does not appear so striking as the Pentlands, seen from Edinburgh. It being a part of the systematic plan of our tour that on this evening we should sleep on the summit of the far-famed Brocken, we resolved on making the ascent, notwithstanding the very unfavourable state of the weather; and accordingly, having selected one of the numerous and importunate fraternity of guides connected with our hotel, we set out on our expedition, about 5 or 6 p.m. After passing a short way up the Radau Valley, we struck off the highway, entering the dark pine-woods which cover the whole of

the base of the Brocken, rendered more dismal on the present occasion by the heavy, wet mist in which they were enshrouded. We now followed a straggling footpath, winding for miles through these pine-woods,—through rugged ravines, and over gigantic boulders, strewn here and there in the wildest confusion: now ascending a new shoulder of the Great or Little Brocken; now descending the slopes of another gorge, or ravine, the dense mist preventing our seeing three feet before us, and effectually soaking our habiliments, and damping our skins, if not our spirits. Still, we pushed on, perseveringly and silently, through wood and brake, over rock and moor, amid the most splendid scenes of desolation (if I may use such an expression), vividly conjuring up before fancy's eye, as we trod this classic ground, the demon scenes of Goethe's 'Faust.' About half-past 7, or 8, p.m., when nearly quite dark, we reached the Brockenhaus, where we were received, in a measure, as 'heroes of a night,' by a parcel of boorish waiters, and a host of yelping curs." The author made a few remarks on the Brocken climate, the circumstances influencing it, and its effects on the vegetation both of the mountains and the plains, noticing in particular the intense cold experienced on the summit, even in mid summer. "It is interesting to find, at an elevation comparatively so insignificant, a miniature glacier, in a deep, shady fissure called the 'Schneeloch,' which lies about 400 feet below the summit, looks to the North-east, and is therefore protected from the direct solar rays, and the warm south winds. The mass of ice or snow itself is some 500 feet long and 16 broad, (according to Brederlow). In its vicinity, we have a miniature representation of all seasons and climates, illustrating what we meet with, on the large scale, when we ascend the Alps, Andes, or Himalayas, from the plains towards the snow-line: on and immediately around the glacier, there is intense cold, with a scanty cryptogamic vegetation; but, gradually, as we recede, we feel the air becoming warmer and more genial, and the vegetation mounting from the lichen and moss, grass and fern, to the *Vaccinium* and heath, evergreen bush and brushwood, blooming flower and ripening fruit." Dr. Lindsay made allusion to some of the more important meteorological phenomena observed on the Brocken, and especially to the so-called "spectre," a kind of "Fata Morgana," which is "merely the magnified shadow of an observer, projected upon a perpendicular wall of dense mist opposite him. The circumstances essential to the production of the phenomenon are, that there be in front of an observer a vertical mass of dense mist, rising from a valley, and behind him, and on the same

level, the rays of a rising or setting sun; the apex of the mountain itself being free from vapour. In such circumstances, an observer sees, on some eminence opposite him, a gigantic shadowy resemblance of himself, waving significantly, if the mass of mist be in motion, surrounded by a beautiful halo, or a magnificent rainbow radiance, or his head alone sending forth the most brilliant stellate rays of golden light, if it be very moist and dense. In winter, it is said that the head of the 'spectre' is often encircled by a most gorgeous starry diadem; the millions of dancing starlets reflecting a light too dazzling for any mortal long to behold with impunity!" The author noticed shortly the mineralogy and geology of the Brocken and surrounding country, especially with reference to their Flora. The mountain itself consists of a mass of granite, rising through the transition strata (chiefly graywacke and clay-slate), of which the greater part of the Hartz district consists. He then entered at length on the subject of the Brocken Flora, mentioning the points in which it resembled or differed from the Flora of the Scotch Highlands. In particular, he noticed the occurrence of *Dianthus deltoides* and *D. superbus*, *Asplenium germanicum*, *Erysimum odoratum*, &c., about Neustadt; *Anemone alpina*, *Carex rigida* and *C. vaginata*, *Hieracium alpinum* and *H. Halleri*, *Linnæa borealis*, *Polypodium alpestre*, *Thesium alpinum*, &c., on the summit of the Brocken (Brockenhöhe); *Eriophorum alpinum*, &c., on the Brockenfeld; *Listera cordata*, *Corallorrhiza innata*, *Digitalis purpurea*, *Carex pauciflora*, *Empetrum nigrum*, *Andromeda polifolia*, *Calamagrostis Halleriana*, *Vaccinium uliginosum* and *V. Vitis-Idæa*, *Oxycoccus palustris*, *Scirpus cæspitosus*, *Sonchus alpinus*, *Blechnum boreale*, *Lycopodium Selago*, *L. annotinum*, *L. complanatum*, *L. alpinum*, &c., on the summits of the higher mountains of the Oberharz. He also noticed the occurrence, on the Brocken and neighbouring mountains, of various rare Cryptogams, especially mosses and lichens; *e. g.*, *Anomodon striatus*, *Grimmia unicolor* and *G. uncinata*, *Gymnomitrium adustum*, *Jungermannia Kunzeana* and *G. Wenzelii*, *Opegrapha petræa*, *Lecidea moro*, *L. glacialis*, *L. atro-rufa*, *L. arctica*, *L. armeniaca*, &c.

The author mentioned incidentally that there is a strong resemblance between the neighbourhood of Hartzburg and Dunkeld, and, in general, that a great similarity exists between much of the Hartz scenery and that of the Scotch Highlands. He gave a description of the "Panorama of the Brocken," and specified some of the legends and superstitions connected with that mountain.

"The forests are not only an important element of the picturesque,

clothing the greater number of the mountains to their summit; but they may be said to be the very foundation of the prosperity of the poor inhabitants of the Hartz, whose subsistence more or less immediately depends on the mines and smelting-houses, for which this district is so famous. These works are supplied almost exclusively by the neighbouring forests with the wood necessary for building and fuel. Were the supply of wood lessened or cut off, or even rendered more expensive, these establishments would speedily come to an end, and the inhabitants of a densely populated district be inevitably thrown out of employment. Few of the mines are sufficiently remunerative to allow of the consumption, as fuel, of coal, which must be brought from a considerable distance, and at some expense; and, indeed, some of the largest of them are worked solely for the generous purpose of affording employment to a large population entirely dependent on them. Wood is also the chief fuel of the peasantry. In such circumstances, it evidently becomes an important matter to preserve and uprear the old and new forests of such a district; and, I believe, in no part of the world are forests tended with such anxious care, both by Government and private parties, as in the Hartz. From so early a period as the sixteenth century, the forest-regulations (*Förstordnungen*) of the Hartz have been of such acknowledged practical value, that they have, with justice, served as models by which the management of all the forests throughout Germany have subsequently been regulated. Over the administration of forest affairs, there presides a Court of Directors, under whom acts a very extensive and complete staff of officers, from the 'Commissioner of Woods and Forests' down to the humble forester or woodman. The Court of Administration immediately superintends the duties of the forest commissioners (*Ober-förster*). Subject to the latter are the district foresters, or superintendents (*Revier-förster*), who are immediately charged with the protection of the woods, and who are assisted by a numerous staff of forest overseers, huntsmen, wood-watchers, &c. Last, but certainly not least, of all the official staff, are the woodmen, probably about 1500 in number, a very peculiar race in the Hartz, living, to a great degree, quite isolated from the world, shut up in their dense pine-forests, having laws and customs of their own. Once a year the whole staff attends a general meeting of the court, which investigates the industrial results of the whole year, regulates the supply of wood and charcoal for the ensuing year, and examines into all important business matters connected with the forests or their produce. This court acts also in conjunction with the Court of Direction of Mines; there being

evidently between the Directors of Mines and Forests a community of interest. The whole forests of the district were measured and estimated in 1820 ; and this process takes place every thirty years. The superficial extent of the Hartz forests is at present upwards of 451,000 acres ; they were formerly much more extensive, but have been gradually diminished by storms, dry-rot, and, above all, by mismanagement ; an unaccountable lavishness in the supply of wood to the peasantry, and to the mines and forges, having tended to produce a marked disproportion between the production and the demand. In 1524 and 1554, among other privileges and immunities granted to the Hartz and its inhabitants, the mines, and works therewith connected, were allowed (gratuitously !) the wood necessary for building and burning ; and the inhabitants, on payment of a nominal forest-tax, were permitted to cut down according to their wants. The result of such a generous expenditure of timber was, as might have been foreseen, such an amount of its consumption, that it speedily became evident to every one that an opposite line of conduct, or preservative measures, were urgently called for. The iron-forges alone consume (annually !) 12,083,810 cubic feet of coal, and the various mines and smelting-works upwards of 29,500,000 cubic feet of wood.

“ We may shortly notice the circumstances which tend to the destruction of the Hartz forests :—

“ 1. Mismanagement (lavish expenditure of wood, mal-culture, &c.) This cause, which has been a fertile source of mischief in times by-gone, is becoming less and less frequent every day, from the better ideas instilled into the Government, on matters of political and social economy.

“ 2. Storms. The exceedingly violent hurricanes and snow-storms so prevalent in the Hartz, are very hurtful, especially to the pines, which frequently grow in loose, rocky, gravelly, or sandy soils, to which their roots do not adhere very firmly. After every severe storm, we can see thousands of fine, tall pines torn up by the roots, scattered about in wild confusion. We probably do not over state when we say that not less than 25,000 pines are annually destroyed in the Upper Hartz by the wind alone. The great storms of 1800 and 1801 tore up, in the neighbourhood of Elbingerode alone, 315,106 trees ; thus at once destroying the produce of 3000 acres of forest-land. Accumulations of snow and ice, floods and torrents, lightning, &c., also contribute to thin the forests. Avalanches are particularly mischievous on the mountains, and in the mountain-valleys, often clearing

away whole pieces of a forest, or thinning patches in the thickest parts of it.

“ 3. Wild animals also destroy large numbers of trees, by biting off the bark or young twigs ; peeling away the juicy bark, by blows with their horns ; or tearing up the young plants. The wild doves and finches in particular commit great depredations ; countless numbers of them attacking the pine-seed, or chopping up the germinating plants : so that plantations of pines in the young state must be watched, night and day, against these feathered robbers. The most deadly foes of the forests, however, are, unquestionably, various species of beetle, especially those of *Bostrichus* (*e. g.*, *B. octodentatus*, *B. Laricis*, *B. calcographus*, *B. villosus*, *B. Hylesinus*, *B. Fraxini*), which burrow under the bark of the older trees, and there deposit their eggs. Great care is taken by the woodmen to kill these animals before they lay their eggs ; but, notwithstanding all their efforts, many thousand trees annually fall victims to this scourge.

“ 4. Dry-rot, which at one period during the last century caused the destruction of 15,196 acres of forest in the Kingdom of Hanover alone.”

The author then spoke of the constituents, or elements, of the Hartz forests, which are divided into “Hochwald,” “Mittelwald,” and “Niederwald,” according to their position on the mountain-slopes. “The forest is most extensive and luxuriant on the southern and eastern mountain-slopes and valleys, and becomes more scanty the more we approach the north and west, and the higher we ascend. While on the gentle slopes of the east and south borders of the range, the forest (consisting chiefly of oak, birch, beech, and fir) grows luxuriantly at an elevation of 1600 feet, on the north and west these trees are displaced, at 1300 feet, by the dismal pine. The red beech (*Fagus sylvatica*) is, especially in the Unterrharz, a magnificent, tall tree, probably next, in point of importance, to the pine, constituting about one-third of the forests of the lower Hartz. The hornbeam (*Carpinus Betulus*), besides being common in the woods, is greatly cultivated, and thrives exceedingly well. The different species of *Quercus* are common in all the lower forests. The maple (*Acer pseudo-Platanus*) and ash (species of *Fraxinus*) spring up abundantly in the beech-woods, and are also planted, to a considerable extent, on low, bare knolls. The elm (*Ulmus campestris*) occurs, comparatively sparingly, in the lower forests. The birch (*Betula alba*) is common in the ‘Mittelwald,’ as underwood, ascending the hills to an elevation of 2680 feet. On sheltered and sunny banks about the base

of the hills, we find here and there the linden (*Tilia Europæa*), wild chestnut (*Æsculus Hippocastanum*), aspen (*Populus tremula*), and black poplar (*P. nigra*). On flat river-banks and marshy plains, and also occurring in alpine regions, at a height of 2650 feet, the alder (*Betula Alnus*) and the knotty willow (*Salix capræa*) flourish, as underwood. A number of experiments, conducted in the neighbourhood of Blankenburg, during the years 1730-50, show that the Hartz is well suited for the growth of a number of foreign trees (*e. g.*, American oak, cherry, tame chestnut, white fir, northern alder, &c.) On the hill-slopes, here and there, may be noticed a few groups of the larch (*Pinus Larix*), which was first introduced into the Hartz in 1731. The Scotch fir (*Pinus sylvestris*) is sparingly interspersed among the *Pinus Abies* and *P. Larix*. The yew (*Taxus baccata*) grows, as a hermit, on a few barren, rugged rocks, and the juniper (*Juniperus communis*) on dry and exposed sandy hillocks. The hazel (*Corylus Avellana*) formerly thrived luxuriantly, but has lately disappeared from the forests, on account of mismanagement. In the woods, *Berberis vulgaris*, *Rosa canina* and *R. villosa*, *Prunus spinosa*, and a number of our ordinary herbaceous plants grow plentifully. *Rubus Idæus* and *R. fruticosus* occur, more sparingly, on old walls and rocks.* In the forests of the lower Hartz, the gloomy pine (*Pinus Abies*) is common; but it reigns exclusively, attaining a great height, in those of the upper Hartz; and the value of its timber in this district is such, that in many places it would be difficult to say whether the pine-woods on the surface, or the rich ores in the bowels of a mountain, were the most valuable. The pine did not formerly cover such an extent of the Hartz mountains as it now does, but has gradually replaced and displaced the oak, beech, birch, &c., which have been destroyed by accident or mismanagement, and which ascended to a much greater height on the hills than at present. The Hartz pines are exceedingly handsome trees, rising to a great height (sometimes 120 feet), and thus making beautiful masts. The handsomest pines I ever saw were in the valley of the Oker, near Goslar. This tree is daily extending itself in the Hartz, flourishing easily where no other forest tree could attempt to grow. It ascends the mountains to the height of 2800 feet, runs down into the lowland val-

* *Sorbus Aucuparia* is much planted as a border to highways, and as an ornamental hedge or garden plant. The other trees, shrubs, and flowers met with in and about the pine-woods are few and insignificant; the brown soil being carpeted by the *Digitalis purpurea*, *Epilobium angustifolium*, *Pyrola uniflora*, *Melampyrum sylvaticum*, *Oxalis Acetosella*, and similar sylvan species."

leys, springs up on the thinnest strata of sandy soil, and even clings firmly to the clefts and fissures of bare rocks. Unfortunately, its development comparatively seldom attains a high degree of perfection; the loose hold taken by its slender roots of the porous soils or rocks, rendering it extremely liable to suffer from the winds, here so prevalent.

“Many of the Hartz inhabitants, and especially the juvenile portion of them, obtain a livelihood by collecting wild forest fruits (*e. g.*, the bilberry, strawberry, raspberry, edible Fungi, &c.), seeds of forest trees (particularly the birch, beech, oak, and fir), German tinder (‘Feuerschwann,’ *i. e.*, *Boletus igniarius*), and various officinal herbs (which are in great repute in domestic medical practice in Germany), and by preparing ‘Birkenwasser,’ and other cooling liqueurs, from the sap of the forest trees.”

Characters of the Natural Order Solanaceæ.

A paper by Thomas Anderson, Esq., ‘On the Characters of the Natural Order Solanaceæ,’ was read.

The author stated that his object was to bring before the Society the subject of a new arrangement of the Solanaceæ, by which Mr. Miers proposes to divide that order; and, after giving the characters of his two divisions, to endeavour to adduce a few reasons, drawn from a consideration of the chemical constitution and physiological actions of the plants, for adopting this new classification of the family.

Dr. Robert Brown, forty-four years ago, in his ‘*Prodromus Floræ Novæ Hollandiæ*,’ hinted that certain genera of the Solanaceæ should either be excluded, or be placed in a separate section, the nucleus of a new order. His remarks, however, were confined to the tribe Verbasceæ only, now placed, by some botanists, among the Scrophularineæ. Again, Mr. Bentham, author of the monograph on the Scrophularineæ, in the tenth volume of De Candolle’s ‘*Prodromus*,’ placed as a tribe of that order the Salpiglossideæ, till then coupled with the Solanaceæ. Notwithstanding these and other attempts to arrange properly these orders, the confusion still existed; and it has been left to Mr. J. Miers to propose what seems to me to be a very rational and proper way of surmounting the difficulty, namely, by establishing a new natural order, intermediate with the Solanaceæ and Scrophularineæ, and intended to include the anomalies of both. The following is the substance of the characters of these two orders, and the interposed one, as Mr. Miers has given them:—First, the true Solanaceæ, with a gamosepalous calyx, 5- (rarely 4-) partite border, the lobes of

which are nearly regular and equal, and the margins always valvate or induplicato-valvate in æstivation; stamens epipetalous, alternate with and equal to the number of lobes, sometimes unequal in size and length, fifth rarely sterile; anthers introrse, bursting by longitudinal slits; ovary generally 2-celled, rarely 3- to 5-locular; style simple; stigma 2-lobed; fruit a capsule or berry, 2-locular; seeds albuminous, numerous; embryo in one suborder slender, terete, curved spirally or in an annular form, in another short and straight; radicle always pointing to the basal angle of the seed, and turned away a short distance from the lateral and somewhat marginal (never basal) hilum. The order is composed of plants with dentate (rarely pinnatifid), exstipulate leaves; inflorescence axillary, more generally extra-axillary or lateral, and in development centrifugal, single, terminal, cymose, panicked, racemose or corymbose.

The plants of this order occur in greatest abundance in the tropics, especially in South America; but some of them are found in all the warmer regions of the earth. In Europe, they are met with principally in those countries bordering on the Mediterranean. In Britain, we have only two indigenous species, *Solanum nigrum* and *S. Dulcamara*. This order does not possess any distinctly narcotic plant, nor any species known to dilate the pupil, either when administered internally, or when applied to the eye: even in large doses, they do not seem to exert any influence on the system, beyond a diuretic and diaphoretic action.

The tubers of some of the species, such as the potato, contain a large quantity of starch, and other nutritive principles; and therefore, over a large extent of the globe, they form most important articles of food.

The new order, the *Atropaceæ*, as has been already stated, is intermediate with the *Solanaceæ* and *Scrophularineæ*, and embraces the anomalies of both, most numerous in the first. Its characters, according to Mr. Miers, are:—Calyx tubular, persistent, more or less divided; border of corolla 5-lobed, seldom bilabiate, slightly unequal, lobes always imbricate in æstivation, never valvate, the margins of one lobe being free from those of the others, in bud often plicated longitudinally; stamens 5, epipetalous, alternate with the lobes of the corolla, usually all fertile, rarely one or three sterile; filaments filiform, one of them sometimes shorter than the others; anthers introrse, sometimes extrorse, bilobed, lobe-cells parallel, usually opening longitudinally, one lobe sometimes sterile; ovary rarely more than bilocular; ovules generally ascending, attached to the fleshy

dissepiment; style simple, stigma bilobed, often peculiarly shaped; fruit a berry, or else a capsule; seed albuminous, generally uniform or compressed; embryo straight, or more or less curved, sometimes spirally; radicle turned from the hilum, which is more lateral than in the true Solanaceæ.

They are herbaceous plants, or shrubs, with alternate or fasciculate leaves; inflorescence somewhat extra-axillary and lateral, in regard to the insertion of the petiole. The order is very poisonous, including such plants as *Datura Stramonium*, *D. ferox*, and *D. Metel*, *Hyoscyamus niger* and *H. albus*, *Atropa Belladonna*, *Nicotiana*, &c. Like the preceding order, the members of this are natives of the warmer parts of the earth, such as the East Indies, China, north coast of Africa, the Levant, and especially of South America. The order seems, however, to extend further north than the former, as, in Siberia, there is a species of *Hyoscyamus*, in lat. 65° or 66° N., and, in Norway, so far north as 64° . In the warmer valleys, Mr. Anderson observed the *Hyoscyamus niger*, growing luxuriantly, where *Solanum tuberosum*, the only representative there of Mr. Miers's Solanaceæ, is stunted, both in the size of the plant and of the tubers, and seldom or never flowers.

Of the Scrophularineæ, the leading characters are:—The tubular corolla more or less curved and irregular, with 4- or 5-partite border, lobes unequal, bilabiate, imbricate, never valvate in æstivation; anthers always introrse; fruit almost always capsular, in a few cases a berry; embryo straight, or slightly curved, with the radicle pointing towards the basal hilum; cauline leaves generally opposite; floral leaves often alternate; inflorescence always axillary.*

This division of the Solanaceæ, notwithstanding the very just objection of most botanists to the multiplication of natural orders, could, he thought, be properly defended, both from the structural characters pointed out by Mr. Miers, and those which Mr. Anderson had been led to draw, from an investigation of the chemistry and physiological actions of the plants.

At least, so far as our knowledge goes of the chemical history, and action on the animal economy, of the Atropaceæ and Solanaceæ, a notable correspondence between botanical characters and physiological properties may be observed; or, in other words, by this new arrangement plants of analogous actions are more closely united,—

* Mr. Miers's observations will be found at length in the 'Annals of Natural History,' second series, Vol. iii. No. 15, and Vol. xi. No. 61.

a result of no mean importance. As a proof of this statement, the *Atropaceæ*, from its botanical characters, comprehends the genera *Atropa*, *Mandragora*, *Datura*, containing almost twenty poisonous species, *Hyoscyamus*, and *Nicotiana*, all of which are eminently poisonous, and, with the exception of the last genus, and this rather doubtful, possessed of the power of dilating the pupil, and rendering the iris insensible to the stimulus of light. Since the first introduction of the natural systems, this action on the pupil has been considered as a most characteristic mark of the *Solanaceæ*, along with well-defined narcotic properties; but the order was known to contain, besides some plants of very feeble narcotic properties, many others entirely destitute of any such action. Among these may be mentioned the *Solanum nigrum*, *S. Dulcamara*, *S. tuberosum*, *S. oleraceum*, *S. auriculatum*, *S. æthiopicum*, and *S. esculentum*, used as food; *S. crispum*, considered a tonic by the natives of *S. America*, and, in truth, the vast genus *Solanum*, composing nearly one-sixth of the order, is not to be designated a poisonous genus. To mention another anomaly in the old order: the various species of *Capsicum* are stimulant, and in considerable doses have caused death, from inflammation of the alimentary canal; but they never produce the slightest approach to narcotism.

When Mr. Miers's characters are applied to the old order, all its known narcotic plants are allotted to the *Atropaceæ*; and the author thought he might safely say that, in the *Solanaceæ*, there is not one plant deserving the appellation of a narcotic. The only statement he found about any plants of Miers's *Solanaceæ* producing dilatation of the pupil, is by M. Dunal, in an essay published many years ago, in which he said he thought he had seen *Solanum nigrum*, *S. villosum*, *S. nodiflorum*, and *S. miniatum*, on their expressed juice being applied to the eye, produce a very slight dilatation, and insensibility of the organ to a bright light; and this condition, he further remarks, continues only from four to five hours; but up to this time Mr. Anderson had found no authentication of these remarks.

When we examine the alkaloids of the two families, we find the same difference in their action. Solanine, derived from many sources, although poisonous, does not, on the authority of Soubeirn, dilate the pupil; whereas all the alkaloids of the *Atropaceæ*, such as atropine, hyoscyamine, and daturine, and perhaps nicotine, exert a wonderful power on the iris, even in very minute quantity.

Mr. Anderson concluded his remarks with the wish that Mr. Miers's modifications may be generally adopted, as keeping pace with our

increased knowledge of the chemical constitution and physiological properties of De Candolle's Solanaceæ.

A paper by Mr. M'Nab, intituled 'Register of the Flowering of certain Hardy Plants in the Royal Botanic Garden, Edinburgh, compared with the flowering of the same species, and in most cases the identical plants, reported on during the three previous years,' was read.

A paper by Mr. P. S. Robertson, 'On the Effects of the past Winter on the Coniferæ and other Plants, in the open ground, in Golden Acres Nursery,' was read.

Mr. P. S. Robertson, of Golden Acres, was elected an Associate.

Thursday, May 12, 1853.—Professor Balfour, President, in the chair.

Donations of British plants for the Society's herbarium were announced from Mr. More, of Trinity College, Cambridge, and Mr. Tate, of Edinburgh.

Professor Balfour exhibited the following donations to the Museum of Economic Botany at the Garden:—From Messrs. P. Lawson & Son, nurserymen: Six cones, from Mexico, supposed to be *Pinus filifolia*. From Miss Gibson-Craig, Riccarton: Specimen of the bulb of a wild hyacinth, which had been perforated while growing by the creeping stem of *Triticum repens*. From Mr. William Gorrie, Preston: Sections of the stems of *Prunus Padus* and *Quercus sessiliflora*.

The President noticed, that a letter had been received from Mr. John Jeffray, the botanical collector in Oregon, dated March 14, 1853, in which he announced the despatch of various boxes, up to No. 9, by different routes. He was on his way to the Rocky Mountains.

Miss Gibson-Craig exhibited remarkable specimens of *Lastrea Filix-mas* and *Athyrium Filix-fœmina*, in which the lateral and terminal pinnae were divided at their extremities into numerous, small, pinnatifid frondlets, giving a peculiarly tufted and crisped appearance to the margin of the fronds, which were of the ordinary size.

Dr. Mackay exhibited a specimen of *Ceanothus rigidus*, in flower, from the open wall of Trinity-College Garden, Dublin, where it was blooming freely on the 3rd of May.

The Rev. G. E. Smith exhibited specimens of *Centaurea Jacea*, from near Killin.

Dr. Balfour exhibited specimens of several species of sea-weeds from Dr. Curdie.

A paper by Dr. Macgowan, of Ningpo, 'On the Soap Beans of China,' was read.

In this paper, the author gave a popular description, chiefly from Chinese authorities, of two species of *Cæsalpinia*, which furnish the soap-bean (*tsaukih*) and the plump soap-bean (*fitsaukih*) of the Chinese. The beans have marked saponaceous qualities, and are used as detergents, for cleaning silver vessels, &c.

Flora of Arran.

A paper by Dr. Balfour, 'On the Flora of the Island of Arran,' was read.

Dr. Balfour gave an account of the Geology of the Island, and noticed the plants which occur in different districts, in connexion with the rocks. He mentioned that he had observed between 500 and 600 Phanerogamous plants, and 27 ferns and Equiseta. He made some remarks on the rarer and more interesting species, especially *Triticum laxum*, *Rosa involuta*, various forms of *Rubi*, *Pyrus fennica*, *Hypericum dubium*, *Mentha sylvestris*, var. *velutina*, *Ulva montana*, *Petalonema alatum*, *Ginnania furcellata*, *Fucus vesiculosus*, *evesiculosus*, &c.; also *Lastrea Fœnisecii* and *L. dilatata*, the rhizomes of which ferns appear to differ in the number and arrangement of the vascular bundles. The section of *L. dilatata* is generally pale, and has comparatively few dark bundles; while that of *L. Fœnisecii* is dotted with black specks.

Dyeing Properties of Lichens.

The third part of Mr. Lindsay's paper 'On the Dyeing Properties of the Lichens' was read.

The author detailed the various processes of manufacture, as carried on in different countries, on the large scale (by the manufacturer), and small scale (by the peasant), with the principles on which these are severally founded. The following is the rationale of the usual process; the mode of treatment, in the case of different lichens, being the same in principle, though differing slightly in detail:—

1. The plant is carefully cleaned, dried, and comminuted, or reduced to powder.
2. This powder is ground, or made into a pulp with water.
3. The ammoniacal liquor, of whatever kind, is added, in smaller or greater quantity, from time to time.
4. The whole mass is constantly stirred, so as to expose it, as freely as possible, to the action of the air.

5. In the majority of cases, some thickening agent is subsequently added, to impart consistence.

And, during the whole process, a temperature of about 60° is kept up.

“To analyse these various steps of the process: the preparatory cleaning is rendered necessary, by the intimate connexion which subsists between lichens and their bases of support, many species corroding and disintegrating even the hardest quartz; hence, many (especially pulverulent and crustaceous species) require a lengthy steeping and washing in water, to free them from adherent earthy impurities. The drying is merely to facilitate the next step, or pulverization, the object of which is to expose, to mechanical and chemical agents, during maceration, the greatest possible extent of surface. The steeping of the powdered plant in water, or its formation therewith into a pulp, assists the subsequent action of the ammoniacal macerant on its particles. Ammonia is the alkali generally employed, in some shape, for causing the development of colour, because experimentally found most uniformly suitable therefor. It is added in small quantity, and from time to time, to supply the loss constantly occurring, from its great tendency to volatilize, especially in the state of free exposure to the air, in which the pulpy mass is kept. The mixture is constantly stirred, for the purpose of more fully exposing every part of it to the action of atmospheric oxygen. The thickening agents sometimes added, towards the end or after the termination of the process of manufacture, are usually genuine adulterations; but they are, also, sometimes added merely to impart consistence, thereby facilitating the making up of the mass into balls, cakes, or lumps, for more easy and convenient preservation. The continued application, during the whole process, of a moderate amount of heat, is a point of great importance. Westring found, as the result of a long series of experiments with a view to determine the effect of heat in the elimination of these colours, that he could, at pleasure, increase or diminish their brilliancy, or vary their tint, according as he macerated in hot or cold liquids. Though I have not been able to verify all Westring's special results, still I quite agree with him in the general ones. I have repeatedly had occasion to observe, however, that, while a continued *moderate* degree of heat was highly conducive to the colour-development, a very slight elevation of temperature caused immediate deterioration; and, in such cases, cold maceration of the same lichen was invariably more successful in its results. My own experiments show that, up to a certain point,

and *cæteris paribus*, the rapidity of elimination, and the richness of colour ultimately produced, stand in a direct ratio to the degree of temperature, but that, above this point, the same ratio immediately declines. The most rapid evolution, however, appears to be inconsistent with the production of the richest and most permanent tints ; for I generally found that the colours most speedily produced by a pretty high temperature, and excess of alkalis, faded most rapidly. I have therefore been more successful in obtaining fine colours by macerating in closed vials, in cool places, with common spring water, and a moderate quantity of alkali, than when I endeavoured (prematurely, as it were) to force on development by an opposite combination of circumstances. In former days, the ammonia was wholly supplied in the form of stale, or putrid, urine, which was gradually added to the powdered lichen ; the mixture frequently stirred, fully exposed to the air, and set aside, to ferment, in a moderately warm locality ; when a sufficient depth of colour and a proper consistence were attained, the mass was dried, after having been made up in the form of balls, cakes, or lumps ; or it was preserved for use in the state of powder. Urine, as a decomposing agent, gradually gave place to different kinds of ammoniacal liquids, obtained by the distillation of decaying animal matters ; and, at the present day, the manufacturers of orchil, cudbear, and litmus, generally use either tolerably pure dilute liquor ammoniæ, or the ammonial liquor of gas-works. Maceration in stale urine, however, is not only still had recourse to in many remote parts of our highlands and islands, by the old women, for preparing dye-stuffs from various kinds of ‘corkir,’* but is largely employed in the manufactories of some of the most extensive orchil and cudbear-makers in England. Manufacturers find, what we should *à priori* expect, that its value as a metamorphosing agent is directly in proportion to the amount of urea it contains. When, therefore, it is very deficient in this substance, it is comparatively useless, and is consequently rejected. This is evidently due to the small amount of carbonate of ammonia generated by the decomposition of the diminished portion of the urea. Mr. Reynolds, of London, informs me that a large orchil and cudbear-manufactory in Leeds, which is in the constant habit of using large quantities of stale urine, collecting it from the neighbourhood, ‘find that, when collected from beer-shops, it is utterly worthless, and they refuse it accordingly.’ As thus employed, urine has generally been looked upon merely as a cheap and easily

* * The vernacular generic term for lichens capable of yielding colouring matters.”

procurable ammoniacal solution; but that it is something more is rendered extremely probable, by the fact that large English firms, which, besides preparing orchil and cudbear, also manufacture liquid ammonia, of every degree of strength and purity, still find it advantageous to employ urine, instead of pure dilute ammoniacal liquors, in the production of these pigments. Perhaps its true value may depend on its putrefactive state; the chemical changes in the nitrogenous or other constituents of the decomposing liquid being communicated catalytically to the colorific (but colourless) principles of the lichen, thereby inducing an alteration in their physical characters, as well as in their chemical composition. This hypothesis would (at first sight) apparently explain a series of phenomena, of the true nature of which we at present know very little; and it appears to be supported by the fact, that on the Continent (and particularly in Holland and France), stagnant and putrid waters, which contain a large amount of decaying animal and vegetable matters (*e. g.*, the filthy stream of the Bièvre, at Paris), are largely used in the manufacture of orchil and litmus, as macerating agents, because experimentally found most efficient in causing the elimination of these colouring matters. But I cannot yet reconcile this hypothesis, nor the supposition that the changes concerned in the production of these pigments depend essentially on some action of ammonia, or its elements, on the colorific principles of the plant, with the fact that the same colours are capable of being evolved, though in a minor degree, by other alkalies than ammonia, and by liquids certainly not in any state of decomposition (*e. g.*, distilled, or pure spring water). To the putrid urine, lime is sometimes added, materially assisting the colour-metamorphosis, by uniting with, and thereby removing, the carbonic acid of the carbonate of ammonia, generated in the liquid; thus separating the ammonia, which then acts as a free agent. The necessity for free exposure to atmospheric air, is well illustrated by the simple fact that many of the lichen-colours, which are at first dull in tint, are increased in intensity and brightness by free exposure and prolonged maceration. Some time ago, I had occasion to open a small bottle of 'red orchil,' prepared in Glasgow, which had lain for some time on the shelves of a museum. Instead of possessing an intense purple-red colour, and a fine ammoniacal aroma, it was of a very dirty, nondescript, brownish red, had a pul-taceous or semifluid clotty consistence, and a musty, urinous, disagreeable smell. But, immediately on spreading it, in thin layers, on paper, thereby exposing a large surface to the action of the air, it acquired its characteristic colour. The following are the chief thick-

ening agents (in most cases added as adulterations :—Gypsum, chalk, flour, kelp, lime, and some siliceous and argillaceous matters ; and, in some kinds of litmus, according to Pereira, indigo is frequently added, to heighten the colour.”

The author entered somewhat minutely into the details of the modifications of the typical process of manufacture (as above mentioned), according to the country where such manufacture is carried on, the species from which the colour is to be extracted, and according as the dye is prepared on the large or small scale, &c. ; and as instances of these local and other modifications, he referred to the mode of preparing “scrottyie” and “korkalett” by the Shetland peasantry ; of various kinds of “corkir,” by the Scotch, Irish, and Welsh ; and various kinds of orchil and litmus, on the Continent, as detailed by Berthollet, Hellot, Micheli, Neumann, Willemet, and others.

Mordants are necessary for the fixation of the colour of most, if not all, of the lichen-dyes, which are characteristically very fugitive ; these accessories, however, seldom acting as mere media of connexion between the fabric and dye, but usually also brightening, or otherwise modifying, the natural colour of the latter. Westring deprecated mordants, under the impression that they would destroy the gummy constituents of the lichens, which he supposed to be the source of the fixation of the colouring matters. That mordants are not essential adjuncts to the process of dyeing, is rendered probable by the statements of Westring and others, as to their having obtained, without such aid, colours, if not absolutely permanent, still sufficiently so to resist the action both of acids and alkalies, and long exposure to the solar rays. From the transient character of the colours yielded by the lichen family, it happens that the part they play in the art of dyeing is but secondary, being used chiefly to contribute a peculiar bloom and richness to other dyes. But this may perhaps be due, in great measure, to the little we at present know of the chemistry of these colouring matters ; and we may yet discover means of rendering them equal to our cochineals, logwoods, and indigos ; while they are (or might, at least, be) far superior in point of cheapness. And we have yet to acquire a very great amount of information as to the colour-yielding powers of the lichens (apart altogether from the question of fixity, or permanence, of tint), which we never shall obtain till this family has been extensively examined, with this special object in view, both at home and abroad. Hoffmann mentions that the nature of the water used in making the various baths, through which the fabric is passed in the process of dyeing, is important. In France

and Holland it has been found, what we should scarcely *à priori* expect, that muddy, dirty, or stagnant water was most suitable; and this circumstance is abundantly taken advantage of in Haarlem, Paris, and Lyons. To this circumstance, he thinks, is partially due the celebrity of the dirty stream of the Bièvre, or Gobelins, in Paris. Some think that the peculiar action of such water, as a macerant or bath, depends on its saline and other ingredients. Westring and others attribute it to the oxygen which it holds in solution; this element apparently being essential to the development of these colouring matters. In proof of the latter view, Westring mentions having noticed that water which had stood a few days in a heated room was no longer suitable for the process of dyeing; and he throws out a hint that, in the case, at least, of lichens whose colouring matters can be eliminated by cold maceration alone, much brighter and richer tints might be obtained by charging the water with excess of oxygen. The same author also asserts, what we should, at first sight, be less inclined to admit, that the very nature of the atmosphere under which the process is carried on, exercises a most important result on its effects. Whether this depends on the relative amount of oxygen, ammonia, &c., existing in it, or what is the rationale of the phenomenon (assuming it meanwhile to be true), Dr. Lindsay could not at present pretend to say.

The author concluded his paper by details of a few of his own experiments on the development of lichen colouring-matters, showing how, and to what extent, experiments on the small scale differ from operations on the large scale. His observations were illustrated by a very complete series of lichen-dyes, which he had recently presented to the Museum of Economic Botany at the Royal Botanic Garden. He promised to lay before the Society, at a future meeting, the further results of his researches on this important subject.

A number of interesting plants, from the Botanic Garden, were placed on the table; amongst others, a collection of rare Scotch and foreign alpine plants; flowering plants of *Siphocampylos amœnus*, *Brachysema acuminata*, *Schottia lævis*, *Chorizema superba*, and *Gloxinia Victoria Reginæ*, recently presented to the Garden by Messrs. Low & Son, of the Clapton Nursery; *Tagelia bituminosa* and *Balsamina latifolia-alba*, presented by Messrs. Henderson & Son, of the Wellington Nursery; *Vriesia speciosa*, presented by Messrs. Jackson, of the Kingston Nurseries; and *Cheiranthra linearis*, a New-Holland plant, with blue flowers, and declinate palmate anthers, presented

by Messrs. S. & G. Rinz, of the Frankfurt Nursery. There were also exhibited a fruited specimen of *Podocarpus Mackoyi* (not known to have previously produced fruit in this neighbourhood); *Passiflora lunata*, which had grown in a Wardian case, recently sent home, and transmitted to the Garden, by Mr. Thomson, of Banchory (the leaves exhibited on the under surface a beautiful series of transparent glands, containing a clear, viscid matter); also a germinating seed of *Zamia* sp., presented to the Garden by Sir William Gibson-Craig, Bart.

Mr. Balfour called attention to a curious monstrosity in a plant of *Gloxinia Victoria Reginae*, showing chorization, or splitting, of the corolla, on the upper side. The dilaminated portions were of a dark blue colour, while the rest of the flower was pale.

George Ralph Tate, Esq., of 16, Cumberland Street, was elected an Ordinary Fellow.

Thursday, June 9, 1853.—Professor Balfour, President, in the chair.

The following donations to the Society's library were announced :—‘Memoirs’ and other publications of the Cherbourg Society for Natural Science, from the Society; ‘Bonplandia’ for June, from the Editors.

Dr. Balfour announced a donation of plants to the University Herbarium, from Mr. Keddie, consisting of specimens collected on Lebanon, by Mr. Sommerville; and exhibited, from Lady and Miss Harvey, living specimens of *Ophrys fucifera*, var. *aranifera*; also sections of woods, including one of the stem of *Cordia Sebestana*, from Dr. Gilbert M'Nab, Jamaica.

Dr. Balfour exhibited several recent donations to the Museum of Economic Botany at the Garden.

Dr. Balfour made remarks on the palms in the Botanic Garden, and stated that some of them had sent their fronds through the roof of the palm-house, and that unless measures were taken immediately for making an addition to the house, he would be under the necessity of destroying some of the finest palms in Britain,—a calamity which he hoped would be averted, by the timely interference of the Commissioners for Public Buildings, to whom he had made a strong representation on the subject. He showed that the public of Edinburgh were deeply interested in the matter; and he had no doubt that he would be aided by them in his efforts to secure for the metropolis of

Scotland, and for the botanical school of Edinburgh, a suitable palm-house, as well as a Victoria-house.

The following are the measurements made, by Mr. M'Nab, of some of the palms in the Edinburgh Botanic Garden. In giving the height, the leafy part at the top of the caudex is included, along with the tub in which the plant is growing :—*Acrocomia aculeata*, 38 feet ; *Areca triandra*, 19 ; *Caryota urens*, 43, (frond 4 feet 9 inches beyond the roof) ; *Chamærops humilis*, var. *elata*, 20 feet ; *Cocos nucifera*, 18 ; *Euterpe montana*, 38, (frond about 2 feet beyond the roof) ; *Livistonia chinensis*, 40 feet, (fronds bent down by the roof of the house) ; *Sagus Rumphii*, 43 feet, (fronds about 10 inches beyond the roof) ; *Seaforthia elegans*, 22 feet. Some of these palms, he stated, were between fifty and sixty years old.

Dr. Greville trusted that Dr. Balfour's efforts would be successful in getting such an enlargement of the palm-house as would enable him to preserve the noble specimens now in the garden.

Dr. Balfour stated that two boxes had been received from Mr. Jeffray, the botanical collector in Oregon, containing numerous seeds ; among the rest, seeds and cones of *Pinus flexilis* and *P. lasiocarpa*, *Picea nobilis*, *Abies Pattoni*, *Pinus monticola* and *P. ponderosa*, some of the kinds being in considerable quantity.

Botanical Trip to Ireland.

Dr. Balfour gave an account of a botanical trip to Ireland, in August, 1852, with some of his pupils. The party consisted of Messrs. Balfour, Sutherland, Fraser, Cowan, Menzies, Sibbald, M'Allum, and Cockell. Dr. B. gave an account of the three Floras of Ireland, as distinguished by Professor Forbes, *viz.*, the Germanic, or Central European, Flora, in the north and east ; the Devonian, or Armorican, Flora, in the south ; and the Asturian Flora in the west. The districts of all these Floras were visited by the party. Dr. B. also gave a general sketch of the Geology of the districts, consisting of rocks belonging to the upper Silurian and the carboniferous series. In the vicinity of Dublin, the party were aided by Dr. Mackay, Professor Allman, and Dr. Robert Ball, to all of whom they were deeply indebted. They visited Howth, Portmarnock, Malahide, the Dargle, and Powerscourt ; and collected, among others, the following species :—*Crithmum maritimum*, *Inula crithmoides* and *I. dysenterica*, *Obione portulacoides*, *Erodium maritimum* and *E. moschatum*, *Beta maritima*, *Carlina vulgaris*, *Ulex nanus*, *Statice occidentalis* and *S. bahusiensis*, *Apium graveolens*, *Euphorbia Paralias*, *Orchis pyramidalis*, *Hymeno-*

phyllum *Wilsoni*, and *Lastrea Fœnisecii*. The Flora much resembled that of the Galloway coast. In the neighbourhood of Cork and Queenstown, the party collected *Ceterach officinarum*, *Œnanthe fistulosa*, *Senebiera didyma*, *Senecio squalidus*, *Fœniculum vulgare*, *Euphorbia portlandica*, *Sinapis nigra*, *Antirrhinum Orontium*, *Petasites fragrans* (near Monkstown), and *Hypericum anglicum* (near Glanmire). In the vicinity of Bandon, under the guidance of Mr. Allman, there were gathered *Wahlenbergia hederacea*, *Hypericum elodes*, *Scutellaria minor*, *Pinguicula lusitanica*, and *Linaria repens*. Near Bantry and Glengarriff, *Eufragia viscosa*, *Calamintha officinalis*, *Hymenophyllum Tunbridgense*, and *Euphorbia hiberna* were seen. On the hilly road to Kenmare, there was abundance of *Saxifraga umbrosa*, and, near Killarney, fine specimens of *Osmunda regalis* and of *Pteris aquilina*; the latter being in some instances nearly twelve feet long. The abundance of the Robertsonian Saxifrages, and of ferns, characterize the mild and moist climate of Killarney.

The Silurian mountains of Killarney, such as M'Gillicuddy's Reeks (Cairn Tuhol) and Mangerton, did not display an alpine vegetation. *Saxifraga umbrosa*, in all its forms, *serratifolia*, *elegans*, &c., covered the hills to their summit. The other plants found on the mountains were *Saxifraga hirta*, *Aira cæspitosa-vivipara*, *Asplenium viride*, *Sedum Rhodiola*, *Cystopteris fragilis*, *Pinguicula grandiflora*, and *Drosera longifolia*. On the islands of the lakes, *Arbutus Unedo*, and, in various parts of the lakes, *Nymphæa alba*, *Nuphar lutea*, and *Lobelia Dortmanna*; at Ross Castle, *Lastrea Thelypteris*; and near Turk Waterfall, *Trichomanes radicans*. The Robertsonian Saxifrages, and the rare ferns noticed, with *Pinguicula grandiflora*, may be said to characterize the Flora of Killarney. After leaving Killarney, the party visited Dingle, and ascended Brandon mountain, on which they found *Ranunculus acris*, var. *Friesii*, *Polystichum Lonchitis*, *Poa Balfourii*? *Saxifraga hirta* and *S. affinis*? *Cystopteris fragilis*, and *Festuca vivipara*; near the shore, *Althæa officinalis* and *Cotyledon Umbilicus*, the latter in immense profusion everywhere. On visiting Limerick, *Œnanthe fistulosa* and *Œ. Phellandrium* were gathered.

Proceeding to Galway, the party visited the Great Island of Arran; and on the limestone rocks of that island they found *Asplenium marinum*, *Ceterach officinarum*, *Adiantum Capillus-Veneris*, *Neottia spiralis*, a peculiar variety of *Saxifraga hypnoides*, *Sesleria cærulea*, *Carlina vulgaris*, *Asperula cynanchica*, *Alsine verna*, *Cerastium arvense*, *Ulex nanus*, *Poterium Sanguisorba*, *Lycopus europæus*, *Haloscias scotica* [?], *Juniperus nana*, *Senecio Jacobæa* (without a

ray), and a very hairy variety of *Plantago Coronopus*. In the fields, there was great abundance of spurred rye. What effect the abundance of ergot had on the inhabitants, the party could not ascertain. Near Roundstone, the plants seen were *Dabœcia polifolia*, *Erica mediterranea*, and *Eriocaulon septangulare*.

Between Roundstone and Clifden, *Erica Mackaiana* and *E. ciliaris* were got; and in the neighbourhood of the latter place *Carduus pratensis* and *Dabœcia polifolia* were found, in great profusion, and with remarkably fine flowers; in Kylemore, it was found with white flowers. In the vicinity of Galway, *Nepeta Cataria*, *Ceterach officinarum*, &c., were collected.

Some of the party afterwards visited Belfast, and gathered *Rosa hiberna*, *Orobanche rubra*, and *Equisetum Mackaii*, *Newm.*

Plants were exhibited to the meeting by Mr. Evans, Mr. Stark, and Mr. M'Nab.

Several candidates for membership were proposed, to be balloted for at the next meeting.

DUBLIN NATURAL-HISTORY SOCIETY.

May 13, 1853.—Robert Callwell, Esq., in the chair.

Trichomanes speciosum.

Dr. Harvey exhibited specimens of *Trichomanes speciosum*, recently found in the Island of Valentia, by Miss Helen Blackburn, daughter of the Director of the Valentia Slate Establishment. This lady found it abundantly, amongst *Hymenophyllum Tunbridgensis* and *H. unilaterale*. The specimens which Dr. Harvey exhibited were of the Killarney form, and dissimilar to the Glouin-Caragh plants, which are distinguished in Newman's 'Ferns' as var. *Andrewsii*. Dr. Harvey alluded to the discovery, last year, of *Trichomanes speciosum*, in Alabama, U.S., and mentioned that a second species had this year been found in another part of America.

Mr. Kinahan took the opportunity of exhibiting several forms of *Trichomanes*, which appeared to him to be distinct. He mentioned their peculiarities and habits, and observed that some he found growing on the face of barren and almost inaccessible rocks, others in the shaded and moist crevices of dripping rocks; while other plants he found altogether growing in bog-mould.

Mr. Andrews observed that a variety of opinions had already been offered and entertained as to the species of *Trichomanes* found in the south-west of Ireland. The Killarney form of the frond was triangular, the lowest pinnæ being the longest, and tripinnated. The plants found in Glouin Caragh had the fronds lanceolate, the lowest pinnæ being the shortest, and bipinnated (var. *Andrewsii*, Newm.) The winging of the involucre also has been noticed as peculiar. It was of much interest to hear of such a discovery in so bleak and unsheltered a position as Valentia Island presented; and he thought the meeting with *Hymenophyllum Tunbridgensis* there equally interesting. Mr. Andrews said that he first found the *Trichomanes* at Mount Eagle, west of Dingle, a very rocky and barren locality. No doubt trees flourished, at one period, both at Mount Eagle and at Valentia; and *Trichomanes* might then have grown abundantly in those places. The Hon. Dayrolles De Moleyns had also discovered a station for *Trichomanes* near Dingle.*

THE PHYTOLOGICAL CLUB,
(*In connexion with the Pharmaceutical Society*).

June 6, 1853.—The President in the chair.

The Curators reported the receipt of several parcels of plants.

Structure of Galls.

Mr. Muskett presented a translation of a paper by M. de Lacaze Duthiers, intituled ‘*Researches upon the Structure of Galls*,’ published in the ‘*Comptes Rendus*,’ April 4, 1853.

The author commences by stating that former writers upon the vegetable pathological productions named galls, have only considered their forms, the plants upon which they are found, and the insects which cause them. Their structure and development have been completely neglected.

Galls are generally considered as purely cellular masses. This is an error, for they contain the principal elements and tissues which enter into the composition of plants. They may be divided into

* In Newman’s ‘*British Ferns*,’ p. 309, it is recorded that this fern had lately been planted abundantly in Valentia Island.—*E. N.*

external and internal galls, from their relations to the vegetable which bears them. The first project outwards, and are only connected with the plant by a very small peduncle ; the second kind are developed within the tissues and organs they deform.

External galls are sufficiently naturally divided into unilocular and multilocular, from the number of cells which they contain.

The unilocular class may be divided into five groups, whose structure is more and more simple as it recedes from the first type. This type is represented by the large gall of commerce, and the French gall. If taken when fully developed, they exhibit, from the surface to the centre :—

1. Epidermis without stomata.
2. Cellular, subepidermal layer, analogous to the cellular tissue of vegetables, containing colouring matter.
3. Zone of irregular, ramose cells, with large cavities : the spongy layer.
4. Layer of hard, prismatic, dotted cells.
5. Layer of very thick polyhedral cells, very hard, much dotted, and forming the protecting layer to the nucleus.
6. Central alimentary mass of soft cells filled with liquid ; the external part containing starch-granules, colourable by iodine ; the internal, not producing this reaction.

The central amylaceous mass disappears gradually during the development of the larva, which does not commence its metamorphoses until it has consumed all the alimentary portion.

May the most internal portion be regarded as fecula modified by a process analogous to the commencement of digestion, or rather as matter more specially azotized, serving for the first phases of embryotic development ?

The French gall, like that of commerce, contains fibro-vascular bundles, which pass from the point of insertion towards the centre, and ramify in the interior of the parenchyma. We find in these bundles, fibres, branching and dotted vessels, and true spiral vessels. These disappear successively, and give the five groups of external unilocular galls before mentioned.

1. Hard and spongy : French gall, and gall of commerce.
2. Hard : spherical galls, on oak-leaves.
3. Spongy : cellular oak-galls, with regular tubercles.
4. Cellular : lenticular galls, on oak-leaves.
5. Protecting layer disappears ; the subepidermic cellular tissue only remains : spherical galls, on leaves of briar.

Compound or multilocular external galls are due :—

1. To cohesion of simple tumours, allied to the fifth group described above : briar-gall.

2. To the development of a hollowed, cellular mass. They may be compared with different groups of the unilocular, being sometimes hard (tumours on roots of oak) or spongy (oak-apples).

In all the external galls, whether simple or compound, the fibro-vascular bundles are placed on the outside of the protecting layers.

Internal galls are true or false.

True galls contain the insect in the interior of their tissues. They are hypertrophies, and have their seat upon all parts of the plant,—on the parenchyma, the nerves, the petioles, the cellular tissues, cortical fibres, medullary rays, and the pith.

False galls are hypertrophies, deforming the organs, and affording the insects protection and nourishment. But the parasites are always on the outside of the tissues of the plant. To this division belong the egg-masses of aphides found on the leaves of the poplar, lime, elm, &c., and the nodosities of the trunk of the apple-tree.

The vegetable hypertrophy, in whatever form of gall it developes itself, does not cause the disappearance of any of the organic elements : it increases their number and volume, and modifies their form.

The *cause* of external galls is the deposit of a liquid venom, with specific properties,—a true morbid poison, secreted by the insect, which deposits it in the plant with its egg. The form, consistence, &c., of the tumours vary with the specific properties of the virus of which they are the consequence.

Internal galls, and more especially the false, appear to owe their formation, as Reaumur has shown, to the abstraction of the liquids of the plants by the suction of the Aphides. This abstraction, in augmenting the vitality of the part, determines, also, its hypertrophied growth.

We could make a third general division, presenting at the same time the characters of external and internal productions ; *e. g.*, artichoke-galls.

The paper elicited considerable discussion.—*R. R.*

A Field Day of Naturalists, at Eastnor, Herefordshire.

A Naturalists' Club having been recently formed at Malvern, the Woolhope (Herefordshire) Naturalists' Club invited the newly-constituted body, together with the Cotteswold (Gloucestershire) Club, to

meet them, for an exploration at Eastnor, near Ledbury, on the 7th of June last. The united party accordingly, numbering upwards of sixty, mustered from their various localities at about 11 a.m., in the valley of the "White-leaved Oak," which is situated between two most southerly hills of the Malvern eruptive ridge, and at once proceeded to the business of the day. Professor Strickland (who occupies the mineralogical chair of Dr. Buckland, at Oxford) attended, by invitation, as an Honorary Member, and now proposed to point out, to those who took an interest in geological researches, the grand features of the country before them, and the relations of the Silurian strata with the Malvern syenitic rocks. He then led a large party to the summit of the Ragged-stone Hill, and to various quarries, where *metamorphic rock* was clearly shown, the result of the action of the eruptive rock on the Silurian deposits; and descanted, also, on the remarkable beds of sandstone in the Obelisk Hill, first noticed by Sir R. Murchison. A most instructive morning was thus passed among the rocks and glens of the southern Malvern range.

Meantime, an ardent band of botanists, including Dr. Bull, of Hereford, Mr. W. H. Purchas, of Ross, and other Woolhopean gentlemen, had placed themselves under the able direction of Mr. Edwin Lees, to gain some insight into the Botany of Malvern, attaching more value to the *clothing* of rocks, than to the naked ribs of mother earth, attended to by their friends. This party had a very interesting ramble among the deep shades of the Holly-bush Hill, where there are indigenous clumps of that tree many hundred years old, the bark covered with venerable cryptogamic crust. They next explored the curious and interesting rocky dingle called "The Gullet," where, darkling through the entrails of the strata, amidst a luxuriant growth of ferns and mosses, a burrowing stream gushes down a deep, densely-wooded ravine between the Holly-bush and Swenchard Hills. The botanical division next ascended to the Obelisk Hill, and closed a most agreeable day by visiting the celebrated *Mistletoe in the Oak*, in Eastnor Park, where Dr. Bull, officiating as Arch-Druid, climbed the summit of the tree, where the mistletoe flourishes in great force, and gathering some branches of the mystic plant, distributed them to his friends beneath, as mementoes of the expedition.

Late in the afternoon, the parties united at dinner at the Somer's-arms Inn, where Barwick Baker, Esq., President of the Cotteswold Club, filled the chair; and the Revs. T. T. Lewis, of Aymestry, and W. S. Symonds, Rector of Pendock, Presidents of the Woolhope and Malvern Clubs, occupied the opposite end of the table. After the

viands had been discussed, and customary toasts drank, the Rev. W. S. Symonds, thanking the Honorary Members for their attendance, made some admirable remarks on the uses of Clubs like their own, and dwelt on the value of Natural History as a part of education. He yet hoped that practical modern science would take its proper place in our universities; and he thought men were as well entitled to honorary distinctions for their powers of observation and research, well carried out, as for exercises in Greek, Latin, or the mathematics. These observations elicited general applause.

Papers were then read, by Edwin Lees, Esq., F.L.S., 'On the Plants of the Silurian Strata, and those peculiar to Limestone Districts, with Reflections incident to the Subject;' by the Rev. G. C. Davis, Vicar of Tewkesbury, 'On the Migration of Swallows;' and by Mr. Hewit Wheatley, of Hereford, 'On the Fishes of Herefordshire.' The paper of Mr. Lees, on the Silurian plants, led to a discussion, in which Professor Buckman, of Cirencester, Dr. Wright, of Cheltenham, and Mr. W. H. Purchas, of Ross, took part. Dr. Wright proposed that a chart should be formed of the country under their notice, showing the plants of each geological formation; and Mr. Lees, Professor Buckman, and Mr. Purchas were constituted a committee to carry out this idea. The party separated, much pleased with their reunion, and hopeful for another at no distant day.

Note on Epilobium Lamyi.

Mr. Syme has this morning sent me word that, since he wrote the note on *E. Lamyi* (Phytol. iv. 933), he has seen a specimen from Prof. Grenier, labelled '*E. Lamyi*,' with the remark '*Cult. ex sem. auct.*'; thus appearing to be indubitably the plant of Schultz. Mr. Syme says this is clearly identical with the plant which I labelled *E. virgatum*. In the absence of figures and authentic specimens, I will hazard no conjectures as to the synonymy, but content myself with observing that the discrepancy between my plant and the description, in the '*Flore de France*,' of *E. Lamyi*, as regards the existence of stolons, remains to be accounted for.—*W. H. Purchas*; *Ross*, May 24, 1853.

[This note was accidentally omitted from the Phytologist-Club Proceedings.]

Notes on the Localities of some Pembrokeshire Plants, observed in May and June, 1853. By EDWIN LEES, Esq., F.L.S.

ONE great advantage of a periodical devoted to British Botany is, to record "the living *flowers* as they rise," to correct former observations, record new localities, or the extension of the bounds of plants; and so keep the tide of research up to high-water mark. I have thus to mention an *alteration*, though not a correction, with respect to a recorded observation of my own. I have stated in the 'Botanical Looker-Out,' that the majestic ruins of Pembroke Castle were overgrown with the silver corymbs of the fragrant *Alyssum* (*Koniga*) *maritimum*. This relates to the observation of sixteen years ago; and the old dame who then was custos of the Castle, and used daily, at morn and eve, to furl and unfurl the banner upon the keep, assured me that, for the twenty years, or more, that she had patrolled the time-worn turrets, she had noticed the *Alyssum* growing there. Time and change will, however, mark the flight of years; for on my present visit to Pembroke not a single specimen could I find anywhere about the Castle; the flag-staff, too, had been blown down in a tempest, and not replaced; the old dame no longer mounted the ruined stairs of the keep; and plant and banner were alike numbered with the things that have been. I felt sorry for the loss of the plant, though, perhaps, only naturalized; but, a day or two afterwards, returning from Boshaston, by the opposite side of the town, I found the *Alyssum* growing, in several very luxuriant tufts, upon the weather-beaten town-walls; and, as there are still extensive remains of these, it will, doubtless, continue to maintain itself there.

Diplotaxis tenuifolia used to be rather abundant at Tenby, generally showing itself, as an old retainer, about domestic spots, even on the window-ledges of the ancient habitations. It is now almost gone, for the thick stone dwellings of the original Flemish settlers are nearly all gone too; and the present race of tall, lean, and hungry-looking white houses, overlooking the dejected walls of olden times, offer the plant no place of shelter suited to its recollections. I could now only find it on three, out of, perhaps, a score, of old places, still remaining relics of the past. Here it still tenaciously clung, in front of the thick casements, and will do so till the remorseless hand of innovation decrees their ruin.

Nature generally supplies some compensation for loss; and so, in place of the "time-honoured" *Diplotaxis*, a modern interloper has

sprung up,—*Centranthus ruber* ; and this red valerian now grows over walls and ruins with such rapidity, that upon buildings in South Wales it seems likely to become as much a pest in its onward spread upon land, as the *Udora* is in its incursions through the water.

I have, in a former communication, adverted to the *Aquilegia vulgaris*, as among the *ill-starred* plants that have a dubious light thrown upon them in the last edition of the ‘British Flora,’ by Sir W. J. Hooker and Dr. Arnott. I was particularly struck, this year, with the abundance of the columbine, both in Pembrokeshire and Caermarthenshire. In wandering around Pembroke, I found it quite general under hedges in shady lanes, in several directions, as well as at Penally near Tenby, and on the road to Haverfordwest, from the latter place ; nor could I see any reason to believe that it was less a true native than *Hypericum Androsæmum*, springing up by its side, which no one has suggested to be an introduction. Possibly the *Aquilegia* may have increased of late years ; but for such a general West-of-England plant, it surely seems strange for the authors of the ‘British Flora’ merely to speak of its occurrence “in several places,” and brand it as not a genuine native. It may be, therefore, well to record, that on the road from Haverfordwest to Caermarthen (and in the latter county), between a place called “the Roses” and the village of St. Clear’s, the columbine occurred in large patches, at intervals, for three miles ; and in one gorsy upland, in particular, was dispersed among the gorse-bushes (*Ulex Europæus*), in every part of the heathy field, making one of those floral pictures, bright with colouring, that so long repose upon the memory.

A few plants may be mentioned, in connexion with the vicinity of Tenby, about the Castle-rocks of which now flourish the most exuberant growth of sea-cabbage (*Brassica oleracea*) and *Smyrnum Olustrum* that ever met my view. Whether this was so previous to the occupation of the Castle, is, perhaps, worth the discussion of those who would pry curiously into the first immigration of plants considered to be “doubtfully wild,” or, “perhaps only escaped from cultivation.” It is an interesting ramble, passing through the singular western portal of Tenby, down the Windmill Hill, and across the sandy Burrows to Giltar Point, and the broken limestone rocks there forming the barrier of the coast. Numerous hills and hollows, with intervening spreads of sand, make the track a devious one ; and some isolated masses of rock, half covered with ivy, and, where bare, deeply tinted with the orange-coloured *Parmelia elegans*, give a picturesque aspect to parts of the scene ; while an old, solitary watch-tower near

Penally, bare as a withered stump, sends the imagination far back, among warring thoughts. Just at this time, the *Rosa spinosissima* was coming into flower ; and its dwarf bushes covered many of the rising undulations with a close covering, now scattered over with stainless globes, for thus the flowers appear, the petals converging together at their first expansion. Finely contrasting with these milk-white globes, are burning bushes of *Ulex Europæus*, patches of flaring *Lotus corniculatus* and *Ranunculus bulbosus*, the azure of the trailing *Veronica*, and the deep purple of a considerable quantity of *Orchis Morio* ; all contributing their bright colours as a foreground to the bare sand-hills, just roughly fringed with stiff, glaucous grass, or tufted with the pallid sea-spurge. In some places the ground was tinged with vivid red, from the viscid stems of a gregarious growth of the little *Saxifraga tridactylites*, which else would have been invisible. Here and there was a deep, round hollow, formed, years ago, by some on-rushing wintry billow ; but where the creeping *Salix fusca* had now found a home. At intervals, stiff clusters of the great sea-rush (*Juncus acutus*) took up a position ; and everywhere *Avena pratensis* waved its elegant silky panicles in the breeze.

At the extreme western end of the Burrows, beyond Penally, a fresh-water marsh stretches inland, but now gradually impinged upon, and likely to be finally obliterated, by the attacks of cultivation. Here the beautiful *Menyanthes trifoliata*, become a comparative rarity, was displaying its fringed petals by the deeper spreads of water ; and, after some floundering among hussocks of *Carex paniculata*, I detected the rising fronds of *Osmunda regalis*, only, as yet, in a barren state. Here, also, in this spongy part of the marsh, I gathered *Lastrea Thelypteris*, but without fructification. Plenty of *Carex intermedia* was here scattered about, and some very fine, tall plants of *C. ampullacea*. In parts of this boggy ground the fragrant *Myrica Gale* grew very thickly ; and at a later period, doubtless, other interesting bog-plants might be found.

The promontory of Giltar Point rises abruptly from the western termination of the Burrows, in a long ridge of carboniferous limestone, which extends along the coast for some distance, till it meets with the old red sandstone near Manorbier. Of course, it offers a pabulum for the usual limestone plants ; but the turf along its summit swarms with the pretty and fragrant *Scilla verna* ; thus giving quite an azure foreground to the scene of shelving rock, sea, and craggy island. The *Cochlearia officinalis* here grows very fine, with some quantity of *Thalictrum minus*, if not, perhaps, rather the var. *majus*, as far as size

is concerned. Further on, but still on the summit of the cliffs, the wandering botanist is excited by the appearance of several beds of wild Asparagus (*Asparagus officinalis*); the stems all in a prostrate state, and many of them intricately entwined together. The plant was now just coming into flower. Beyond these Asparagus-beds, among the broken cliffs, that, like a breached fortress, form a glacis towards the sea immediately opposite to Margaret's Island, *Inula crithmoides* grows sparingly; and I only observed it in this spot. Still following the indented coast-line towards a little bay, several yawning "cauldrons," as they are locally called, present themselves, in the shape of deep cavities, somewhat like lime-kilns, but on a larger scale, where the ground has fallen in, and frequently communicating with the sea, by an arched passage. These, being without any protection around them, should be noted, as they must be dangerous to any stranger returning in the dusk, or disguised by a fog. The cliffs rise to their loftiest point above the sandy bay of Lydstep, forming a perpendicular mural wall, not easily explorable. The face of this had upon it a dense, but dwarf, growth of privet and ivy, among which I gathered several specimens of *Orobanche Hederæ*. On the hill close to Manorbier, the *Ulex Europæus* forms such a close shell-like covering to the high ground next the sea, leaving no margin whatever for the foot, that it was next to impossible to penetrate it. The fatigue, at any rate, in a hot sun was too great, and I gave it up. Some plants that I remarked at other times, in the course of my walks, may be mentioned, as below; for there seems to me utility in making records of vegetable appearances, at different times, as they come under the botanical eye.

Ranunculus parviflorus. Plentiful in arable fields on the cliffs opposite Ramsay Island.

Matthiola incana. This was growing on a wall at Pater, near the sea; probably naturalized there: but, as it is very seldom seen on walls, it may suggest whether or not to be found on rocks of the craggy Pembroke coast. *M. sinuata* has been mentioned by the late Mr. Adams as growing "near Pembroke."

Cheiranthus Cheiri. Quite covering an isolated mass of rock on the shore in front of the terrace at Tenby, and the adjacent rocks; doubtless naturalized, yet looking more in the character of a native than I have anywhere seen it.

Arabis hirsuta. Growing plentifully in the sand of the Burrows, which it seemed to prefer to the rocks.

Cochlearia officinalis, and vars. Very large and fine at Giltar

Point. Var. *Groenlandica* on the rocks. Var. *Danica*, with purple flowers, on the town-walls.

Lepidium ruderale. I noticed a considerable quantity of this plant, growing dwarf upon a very hard limestone-wall at Penally, near the Backwater.

Senebeira didyma. At the bases of walls about Pater.

Raphanus maritimus. On the precipitous rocks at Lydstep, west of Tenby.

Saponaria officinalis. About Penally, on the Pembroke road.

Cerastium tetrandrum. Most abundant on the rocks and walls. Stem, pedicels, and sepals so densely hairy and viscid, that they become loaded with particles of sand blown upon them; thus looking strangely disfigured.

Lavatera arborea. I inquired at Pembroke for the craigsman who had formerly got this plant for me, from the Great Stack Rock; but was sorry to hear that, in collecting eggs, he had slipped from his high position, literally smashed to death; and no successor had been found to fill this dangerous post. The *Lavatera* did flourish profusely on the isolated Elyange Stack; but the billows appeared to have so degraded it, that I could not at this time see the plant anywhere about. I was informed it grew abundantly on rocks called "The Bishop and his Clerks," near Ramsay.

Hypericum Androsæmum. Near Penally, St. Petrax, and Stackpool.

Erodium maritimum. On Caldy Island.

Medicago maculata. Among the turf on the rocks above the Norton Sands.

Vicia lathyroides. In a stony field east of Waterwinch.

Trifolium scabrum. On Windmill Hill, Tenby.

Prunus Avium. Not uncommon in hedges about Tenby and Pembroke, and St. Clare's, in Caermarthenshire.

Ribes Grossularia. Numerous seedlings among thickets at Penally; whence derived, I know not.

Petroselinum sativum. In crevices of the rocks of St. Catherine's Isle, near the ruined chapel. This is a true naturalization, very different from a stray plant on a garden-wall. Doubtless it has been here from Catholic times, when some anchorite "from youth to age" performed his daily orisons, and cultivated the barren rock. The plant must be well known here traditionally, for I observed a group of joyous children bounding among the cliffs, to gather the parsley.

Asperula Cynanchica. On the turf near Giltar Point, rather sparingly.

Hieracium cæsium. Among the rocks at Giltar Point.

Antennaria dioica. On the turf near the old watch-tower, where some broken rocks indicate the ancient boundary of the Tenby Backwater.

Inula crithmoides. Among broken rocks west of Giltar Point, just opposite to Margaret's Island. Abundant at this one spot.

Conyza squarrosa. Between Penally and Manorbier.

Matricaria maritima. On the rocks between Bosherton Meer and St. Gowan's Chapel. I observed it nowhere else on this coast. Even to superficial view, the wider-spreading flower of this plant has a much more handsome appearance than that of *M. inodora*. Leaflets broader and shorter, inflated at their edges, the petiole channelled and polished.

Ligustrum vulgare. Abundant on the rocks of the Pembroke coast; though the authors of our Floras confine it to "hedges," whence a doubter might suggest it as "probably introduced."

Myosotis collina. Very small, but pretty, on St. Catherine's Isle, and other parts of the coast-line.

Veronica montana. Stackpool woods, near Pembroke.

Calamintha Acinos. On Windmill Hill, Tenby.

Statice binervosa. On rocks west of Giltar Point, but in small quantity.

Euphorbia Portlandica. Near the Backwater, at Tenby; and on Caldy Island.

Allium oleraceum. Among rocks on the descent to the sea, from the Windmill Hill.

Neottia spiralis. On the sandy shore of the Backwater.

I only intend, in this paper, to note the vegetation that fell under my own view at this particular time. Such notices, by competent botanists, are, I think, advantageous; because changes are always in progress, more or less influencing the continuance, or causing the banishment, of particular species of plants. The Backwater at Tenby is now partially drained, and inclosed by stone-walls, to the detriment of its pristine beauty; and while I was there the northern side of the Burrows themselves was invaded, and columns of smoke daily trailing heavily over the ground, from heaps of smouldering gorse and withering plants; appearing, to a botanical eye, like the destruction and desolation of a battle-field.

EDWIN LEES.

Cedar Terrace, Henwick, Worcester,

July 11, 1853.

Extracts from the 'Proceedings of the Linnean Society.'

(Continued from page 859).

On the Development of Ferns from their Spores; by A. Henfrey, Esq.

The author commences his paper by referring to the remarkable discoveries published by Count Leszczyc-Suminski in 1848, and the observations to which they have subsequently led on the part of others; which appear to necessitate important changes in our general views of the reproduction of plants. He finds, however, that the results of some of these later observations differ in many respects not only from those of Suminski, but also among themselves; and that opinions are divided both as to the actuality of the most important fact of all, *viz.* the process of impregnation, and as to the period and circumstances of its occurrence. Under these circumstances he has thought he would be performing a useful task in subjecting the question to minute investigation, in the course of which he has carefully traced the development entirely through its course from the spore to the young leafy plant, applying every available means to clear up the anatomical conditions in each stage of the progress. The drawings which accompany the memoir were nearly all made by means of the camera lucida eye-piece, so that they represent preparations actually seen.

The subject is treated of under three heads: the first section containing the author's own observations; the second, a critical examination of those of preceding authors; and the third, a few remarks on the general bearing of the results upon vegetable physiology.

Under the first head, Mr. Henfrey describes first the prothallium, and its mode of growth, enlargement and decay; secondly, the antheridia, with their sperm-cells and spermatozoids; thirdly, the arche-gonia, with their papillæ and embryo-sacs; and fourthly, he gives his own view of the development of the embryo. On all these points he enters into much detail, tracing the several stages of the process with great minuteness. In his criticism of previous observations, he passes in review the facts and opinions stated by Nägeli, Suminski, Wigand, Thuret, Hofmeister, Schacht, Mettenius, Von Mercklin, and Hofmeister again; and indicates the points in which he himself either coincides with or differs from each of them. The memoir is so completely one of detail, that under these two principal divisions it would be difficult to give a sufficiently clear abstract without running to too great

a length; and this is the less necessary as the memoir itself will immediately appear in full in the Society's 'Transactions.'

Under the head of "Development of the Embryo" the author gives the following statement of his opinion on the question of impregnation, and the mode in which it is effected:—"My opinion with regard to the fertilization is, that the operation is effected by the contact of one or more *spermatozoids* with the mucilaginous filament contained in or hanging from the mouth of the canal of the *archegonium*. I have seen the *spermatozoids* swimming in numbers around the mouths of *archegonia*, but never detected one inside, and I do not see any good reason for supposing such a process necessary. The pollen-tube of flowering plants only comes in contact with the outside of the embryo-sac, and the influence is sometimes communicated through a long suspensor; and there does not seem to be any sufficient objection to the supposition, that the contact of the *spermatozoid* with the filament of mucilage which lies in the canal of the *archegonium*, suffices to convey the necessary stimulus. I imagine this stimulus resides in the mucilaginous fluid in which the *spermatozoid* is bathed in the *sperm-cell*, and which, adhering to this, is conveyed to the mucilage (protoplasm) of the *germinal vesicle*, just as the contents of the pollen-grain become combined with the protoplasm of the germinal vesicle in flowering plants. The nature of the process is clearly a problem beyond the reach of science, but it seems to me a necessary induction from the facts in the Phanerogamia, that the phenomena result there from the material union of two fluids, and I hence conclude that this is the case here. The comparatively few cases of successful impregnation among these *prothallia*, so many of which prove sterile, may perhaps be accounted for by the peculiar conjunction of circumstances required to bring a sufficient amount of the fertilizing fluid, by means of the *spermatozoids*, to the *germinal vesicle*, at the precise epoch required."

His general "conclusions" are as follows:—"In summing up all these statements it becomes evident that the balance of evidence is in favour of the existence of sexual organs, and of a process of impregnation, giving rise to a new individual, as asserted by Suminski, although under conditions somewhat different from those described by that author. Only two of the observers who have repeated his investigations throw doubt upon these points, namely, Wigand and Schacht; the statements of the former as to matters of fact are far from sufficient to bear out the mass of argument he has built upon them against the existence of sexes; in fact, his observations were so

imperfect that he described the two parts of the *archegonium*, the *papilla* and the enlarged *embryo-sac*, as distinct structures; while he never traced the origin of the new plant at all. His observations may therefore be safely passed over. Schacht's are more complete, but he again only *argues* against the probability of a sexual conjunction, with the preconceived notion that this must be analogous to what he erroneously believes to be the conditions in the Phanerogamia; while his observations furnish facts which greatly support the probability of an impregnation by the *spermatozoids*; the difficulties he suggests being of little weight in comparison with those of accounting for the existence of all the peculiar structures by any other hypothesis. The opinions of all the rest are in favour of the impregnation (Thuret does not treat of the *archegonia*), and the differences between them, except in the case of Suminski, are unimportant in a physiological point of view, merely presenting questions of anatomical and morphological interest. And since Suminski's description of the mode of origin of the embryo would be altogether at variance with what exists, not only in other plants, but also in animals, and is opposed to the observations of all the rest of us (except the doubtful support given by Von Mercklin), I cannot but repeat my belief that he was led from the facts by his imagination being preoccupied by Schleiden's doctrine of the impregnation of the Phanerogamia."

On Venation as a generic character in Ferns; with Observations on the genera Hewardia, J. Smith, and Cionidium, Moore; by Thomas Moore, Esq., F.L.S., Curator of the Botanic Garden, Chelsea.

The object proposed by the author is to inquire—1st, into the general importance of modifications of the vascular structure of the fronds in distinguishing the genera of ferns; and 2ndly, into their relative value in the cases instanced. He begins by referring to the numerous authors by whom the venation has been turned to account in the formation of genera or subgenera, and in particular to the observation of Mr. Brown, that "for subdivision, the most obvious as well as the most advantageous source of character seems to be the modifications of the vascular structure, or the various ramifications of the bundles of vessels or veins of the frond, combined with the relation of the sori to their trunks or branches." He notices an instance in which Sir William Hooker has given generic importance to this

character of venation alone, *viz.* in *Dictyoxiphium*; while in *Schizoloma* he regards the venation as only of subgeneric value; and he treats it as a mere question of words, to be decided by convenience, whether or not this character should be generically employed. In the case for instance in reference to which Mr. Brown's remarks were made, *Polypodium* (*Dipteris*) *Horsfieldii*, it seems to him, as a matter of convenience, a much simpler and more easily comprehensible idea, to regard *Dipteris* as a group of ferns with round naked sori, dichotomous primary veins and reticulated venules, than to have to recognize in *Polypodium* (a genus of ferns having round naked sori) an included group called *Dipteris*, in which the primary veins are dichotomous and the secondary reticulated. In most cases, indeed, he regards subgenera as at the best but cumbrous contrivances.

Looking at the question of venation, as illustrated in the great and universally adopted natural divisions of flowering plants, he thinks its generic importance in ferns rests on better grounds than convenience alone. In the case of flowering plants the presence of complete floral organs affords the necessary diversity for generic distinction; but as an equivalent to these we have in ferns nothing more than certain naked or covered aggregations of spore-cases, which in the great bulk of the species scarcely afford any differential characters, or such only as are microscopic, and therefore not to be resorted to until all more obvious features are exhausted. But peculiarities in the venation of ferns are for the most part associated with peculiarities of habit; and since it appears quite justifiable to employ other characters than those derived from the fructification in distinguishing generically such groups as the ferns, in which the fructification affords comparatively so little variety, what is there so constant and unvarying, and at the same time affording such diversities, as the peculiarities in the development of the vascular structure? Experience, moreover, attests this character of venation as one to be relied on with perfect confidence, because (with very insignificant exceptions) whatever modification of vascular structure is met with in a particular species, that and no other is found in that species. The author concludes, therefore, that without lowering the importance of the fructification of ferns in distinguishing generic groups, the modifications of venation are properly as well as conveniently admitted to share in the same office.

Passing to the question, whether a reticulated venation is in itself a sufficient generic distinction among the ferns, he determines it in the affirmative, inasmuch as a genus being in his view an arbitrary group, all that is really required as a generic character is a constant diffe-

rence from established genera in the structure of some important organ or system of organs. Now the vascular system must be regarded as of the highest importance in the vegetable economy even in reference to propagation, it being not at all infrequent to meet with extraordinary means of development in connexion with it, *viz.* adventitious buds; and in ferns particularly those points of the veins which serve in normal cases as the receptacles to which the sori are attached, in other cases become viviparous and develop gemmæ from which new plants are produced. He believes, moreover, that characters derived from this system of vessels, when taken in connexion with the fructification, though sometimes forming groups of considerable extent, and occasionally separating species having some external similarity, nevertheless in no case bring together obviously ill-assorted species, but rather associate those of obvious similarity and affinity.

For these reasons he is not prepared to follow Sir W. Hooker in setting aside the genus *Hewardia* of Mr. John Smith. He regards the difference as broad and important between the accidental anastomosing of contiguous venules which occurs in some species of *Adiantum*, and a constant and complete reticulation, such as exists in the genus *Hewardia*; and he concludes that that genus should be retained. This conclusion he finds unexpectedly confirmed in Fée's 'Genera Filicum,' just received in this country, where the same view is taken of the species of *Hewardia* as that which he had previously adopted, and an additional species (*H. serrata*) mentioned, of which he had no previous knowledge.

The species enumerated by the author are arranged as follows:—

* Sori continui; venæ primariæ costiformes.

1. *Hewardia adiantoides*, *J. Smith* = *Adiantum Hewardia*, *Kunze*.
2. *H. dolosa*, *Fée* = *Ad. dolosum*, *Kunze*.

** Sori interrupti; venæ uniformes.

3. *H. Le Prieurei*, *Fée* = *Ad. Le Prieurei*, *Hook*.
4. *H. serrata*, *Fée*.

Mr. Moore regards *H. Wilsoni*, *Fée* (*Adiantum*, *Hook.*), as a true *Adiantum*; as also Sir W. Hooker's variety γ . of *Ad. lucidum*. In both these the dichotomous veins occasionally anastomose; but there is nothing like complete reticulation, and the union, when it does occur, is evidently accidental.

If the name *Hewardia* be retained, as the author proposes, for the

genus of ferns to which it was first applied, he suggests that of *Iso-physis* for the Melanthaceous genus, subsequently so called by Sir William Hooker in his 'Icones Plantarum,' t. 858, the species retaining the name of *Tasmanica*.

The same rule induces the author, in the second case referred to, to separate from the genus *Deparia*, *Hook.*, a species having a truly and constantly reticulated venation, that of *Deparia* being uniformly free. The species in question is *Deparia Moorii* from New Caledonia, named by Sir Wm. Hooker after Mr. C. Moore, the Director of the Sydney Botanic Garden, by whom it was discovered; and the following are its generic characters:—

CIONIDIUM, *T. Moore in Gard. Comp.* (nomen tantum).

CHAR. GEN. *Venæ* reticulatæ. *Sori* semi-globosi, extra-marginales, in venularum apicibus excurrentibus pedicellati; *capsulis* pedicellatis. *Indusia* stipitata, subcyathiformia.—Fröndes *bipinnatæ*; *soris ex utrâque pinnularum pinnatifidarum margine prominulis*.

Cionidium Moorii, *T. Moore*, l. c.

Deparia Moorii, *Hook. in Journ. of Bot.* iv. p. 54, t. 3.

Hab. in Novâ Caledoniâ, *D. C. Moore* (1851).

Note on the Nature of Fasciated Stems; by the Rev. William Hincks, F.L.S., Professor of Natural History in Queen's College, Cork.

The author lays it down as an indubitable principle, that what we call monstrosities or anomalies, either in the animal or vegetable kingdom, are always susceptible of explanation from the operation, under unusual circumstances, of causes or principles the ordinary operation of which produces the normal structure of the species. Hence they are always worth studying until a satisfactory explanation of their nature has been arrived at, and even when that is accomplished they have still an interest as illustrations of principles which we apply in the explanation of normal structures, or as proofs of the truth of particular views in respect to the origin or relations of parts in certain tribes. In accordance with this view of the importance of such investigations he proceeds to the consideration of the nature of fasciated stems, which, in concurrence with the view taken by Linnæus in his

'Philosophia Botanica,' he is disposed to regard as formed by a group of coherent stems. According to this view the real peculiarity would consist in the number and remarkable arrangement of the buds, the coherence of stems brought together in such a relative position being, as shown by innumerable examples, a matter of course. Having regard to the crowded or unusually placed buds which are found in the anomaly called plica, tracing this cohesion upwards from the not uncommon adherence of two stems, and observing what must necessarily happen from numerous branches occurring together, it seems to him that the fascia is by no means difficult of comprehension. The striæ which it almost invariably presents exhibit the traces of the lines of junction; and the curved or spiral contraction, which is so often met with, is perhaps accounted for by the growth in connexion with each other of internodes of unequal length. He would not, however, affirm that every stem which is called fasciate is composite in its nature; for that term has been extended to cases of riband-like expansion, which, although dependent also on excess of nourishment, are distortions of a single stem.

Mr. Hincks then refers to the objections taken to the theory of Linnæus by several recent physiologists, and most clearly and explicitly stated by M. Moquin-Tandon in his '*Téatologie Végétale*' under the following heads:—1. "We find plants with a single stem fasciated (as *Androsace maxima*), and nothing announces to us that we have in this case several individuals united together." 2. "On certain fasciated stems we may remark that the branches are of the same number and the same arrangement as in the normal condition." 3. "Two branches accidentally united in the direction of their length form a body of which the transverse section presents a figure more or less resembling a figure of 8, if the coherence is recent or slight, and an elliptic or rounded figure if it is of long standing or very intimate: traces of two medullary canals are almost always found. In a fasciated stem the section gives an elongated figure in which we commonly observe only one compressed canal." 4. "To obtain a fasciated stem by coherence a great number of united branches would be required; but though an accidental union of two branches or of three may be admitted, it is very difficult for it to occur at the same time among four, five, or six. It is very difficult to suppose that these branches should all meet longitudinally, and that the union, instead of taking place around the central axis, should be entirely in one direction." 5. "If fasciated stems were the result of many combined branches, we ought to find cases in which the union is incomplete, and to be

able to observe on their surface such a distribution of leaves or buds as would announce the fusion of many partial spirals or verticils."

Setting aside the anomalies before alluded to, and guarding against the assumption that mere adherence explains an appearance which chiefly depends upon a peculiar position of buds and the production of numerous branches in a certain relation to each other, Mr. Hincks regards these arguments as not possessing any great weight. In regard to the 1st he remarks, that herbaceous plants which have usually but a single stem, not unfrequently produce several, which often remain distinct, but their union into a sort of fasciated stem is by no means uncommon. In proof of this he showed specimens of *Primula vulgaris* and *Hieracium aureum*, exhibiting the union of two stems so produced, and of *Ranunculus bulbosus* showing still greater complexity in the stem, while the principal flower appeared to be made up of two or three combined. The 2nd objection may appear in certain cases to be just, but the author is of opinion that it is hazardous to conjecture that we have no more leaves present in a fasciated stem than we should have in the same space in an ordinary one, and he referred to specimens on the table as distinctly proving that an increased number of leaves and buds is a general character of fasciated stems. M. Moquin-Tandon himself has, indeed, referred to an instance in *Bupleurum falcatum* where the leaves had been whorled, doubtless, Mr. Hincks observes, from those belonging to two or more stems being collected together. The 3rd argument he regards as very deceptive, for the nature of the transverse section presented by coherent stems must depend not only on the intimacy of their union, but also on the internal structure of the stems themselves. When two flowers adhere without much pressure, they exhibit uniting circles somewhat resembling a figure of 8, but when more completely combined they have one circumference of a much-elongated figure, and something similar is to be expected in herbaceous stems. Even the elongated pith of a transversely cut woody fasciated stem only marks the intimate union of several branches; and the author has noticed instances of the union of two and only two stems when the internal appearance was the same as in other fasciations. The 4th objection is derived from the improbability of the lateral union of many stems; but in addition to the common examples of the union of two stems, the author appealed to a distinct case of a union of four flower-stems of *Scrophularia aquatica* so complete that a composite flower was formed containing all the parts of the four component flowers, and produced a fasciated stem of *Ranunculus bulbosus*, where the union

of several stems terminated in a flower having at least double the usual number of parts, as indisputable evidence of the fact. He also laid before the meeting examples of numerous branches laterally arranged as if ready to combine, in immediate connexion with fasciated stems, which, according to his view, are made up of similar branches already combined. To the 5th and last objection he answers that cases in which the adherence is incomplete, and on which the marks of fusion of several stems are to be perceived, are in fact frequently met with, and may be appealed to as strong direct evidence in favour of the Linnean theory. A striking example is given in DeCandolle's '*Organographie Végétale*' (pl. 3, f. 1) in a stem of *Spartium junceum* having several branches only imperfectly fasciated; and similar specimens of *Aucuba Japonica* and *Cotoneaster microphylla* were exhibited, together with a fasciated ash, in which the traces of numerous stems were observable upon the surface.

The author stated his conclusion to be, "that the fasciated stem is best explained from the principle of adherence, where, from superabundant nourishment, especially if accompanied by some check or injury, numerous buds have been produced in close proximity; and that the supposition of a leaf-like expansion of the elements of a single stem is insufficient to explain the usual appearances, and is founded on a false analogy between fasciated and certain other anomalous stems."

The specimens exhibited were from a collection formed by the author and now in the Museum of Queen's College, Cork. They consisted of—1, an intimate adherence of two stems of *Bunium flexuosum*; 2, an entire adherence of two stems with their heads of flowers of *Hieracium aureum*, and of two or more stems of *Primula veris*; 3, a fasciated stem of *Ranunculus bulbosus*, with the terminal flower formed by the union of two, and the stem showing other signs of composition; 4, a fasciated stem of *Cheiranthus Cheiri*, apparently consisting of at least three united branches; 5, a fasciated stem of *Veronica maritima*; 6, two stems of the same plant, in which the buds which usually produce individual flowers have produced secondary stems themselves flower-bearing, so as to transform a simple into a compound spike; 7, a fasciated stem of *Aucuba Japonica*, seeming to prove the composite nature of such stems; 8, a fasciated stem of *Cotoneaster microphylla*, in which the composite structure is peculiarly evident; 9, a fasciated stem of *Fraxinus excelsior* showing a crowd of buds and of small branches in a linear series at the extremity of fasciated portions, and also showing the curved contraction of

the fasciated branches from weaker branches being connected with a stronger one. The author also referred to a remarkable fasciculation of *Asparagus officinalis* in the same collection, the upper portion of which is spirally twisted, and the crowded branches from which seem to prove the presence of several stems; and to some fine specimens of fasciations from the Society's collection which were placed upon the table.

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-seventh Sitting.—Saturday, July 23, 1853.

MR. NEWMAN, President, in the chair.

The President read the following communication :—

Lilium Pyrenaicum and Dianthus Armeria.

“ The following is an extract from a letter I have just received from a friend, of Northam, near Bideford, North Devon. He says :— ‘ The man who works for me occasionally in my garden, tells me that there is a large patch of wild yellow lilies growing in Littleham Bottom (at least he remembers them some years ago, when he went out fishing, as a lad), not near any house.’ Is it possible that this is another locality for *Lilium Pyrenaicum*?—if so, I should think its true nativity need not be doubted. Littleham is about thirty miles from the South Molton station, where I first noticed it, and three miles from Bideford. I fear I shall not have an opportunity of searching for the plant this season; but should any of your correspondents happen to be in North Devon just now, I shall be happy to give them the address of the person mentioned in my friend's communication, from whom they could ascertain the exact location of the ‘yellow lily.’ Between South Molton and Mollond, the *Lilium* has flowered abundantly this season, and so has a root I brought with me from that locality last September.

“ My friend also tells me, he has found *Dianthus Armeria* in abundance, for half a mile, in a hedge between Bideford and Abbotsham. I am not aware that its occurrence has been previously noticed in

North Devon."—*G. Maw; Barrett's-Hill House, Broseley, Salop, July 21, 1853.*

THE PHYTOLOGICAL CLUB,
(*In connexion with the Pharmaceutical Society*).

July 4, 1853.—Robert Bentley, Esq., F.L.S., &c., in the chair.

A donation of British plants, from Mr. Braithwaite, was announced; also a capsule of a species of *Gossypium*, from Mr. J. Fordham, jun.

Udora Canadensis, &c.

The President presented some specimens of the *Udora Canadensis*, in flower, taken from the lake in the Royal Botanical Gardens, Regent's Park. [After describing the extraordinary increase of this aquatic, as already detailed in the 'Phytologist,' and in confirmation of previous accounts,] Mr. Bentley stated that, about three years since, a plant accidentally found its way into the lake in the Gardens of the Royal Botanical Society. This had multiplied to such an extent, that at the present time there was scarcely a portion of the lake to be found which was not matted with it. As the female flowers were alone known in this country, this increase is extraordinary, as it must take place almost entirely by the formation of buds in the axils of the leaves; each being capable of forming an independent plant, when separated from its parent. Every fragment, therefore, into which the plant might be readily divided was capable of developing a new one; so that, like that pest of the agriculturist, the common couch-grass, the more it was disturbed, and cut up into pieces, the more rapidly did it spread, as by such means the separated portions were only placed in more favourable circumstances for their propagation; and hence, also, the difficulty, indeed almost impossibility, of eradicating it from those places in which it had become established. Mr. Bentley, therefore, particularly cautioned botanists to be very careful not to introduce it into any waters where its increase might be attended with injurious results.

Mr. Bentley also exhibited the following specimens:—

1. A leaf-bearing branch, and the fruit, of the *Myrospermum* of Sonsonate. He stated that this plant had been fully described by the late Dr. Pereira, in the 'Pharmaceutical Journal,' vol. x. p. 280, as one of the sources of the common black balsam of Peru, the white balsam, and balsamito. The specimens shown by Mr. Bentley were

obtained from the same source as Dr. Pereira's, namely, from Mr. Skinner, to whom botanists and pharmacutists were under great obligations, for the trouble he was always ready to take to facilitate their investigations.

2. The spadix, with flowers and fruit, of the *Colocasia odora*. The leaves of this plant, and those of allied species, although very acrid when fresh (like most of the plants of the natural order Araceæ, to which they belong), when boiled are commonly eaten in some tropical countries; and from their corms a nutritious soup is prepared.

3. The flowering stem and fruit of *Thalia dealbata*, natural order Marantaceæ. These two latter specimens were obtained from the Royal Botanical Gardens.

4. A portion of *Hydrodictyon utriculatum*, under the microscope, showing the movable spores, &c.

Portland Arrow-root.

The following paper, 'On Portland Arrow-root,' by Mr. T. B. Groves, was read.

"In the course of lectures on *Materia Medica*, of the Pharmaceutical Society, delivered in the session of 1850—51, by our much-lamented Professor, Dr. Pereira, he mentioned some facts relative to the manufacture of Portland arrow-root, which led me to infer, that he considered it was carried on to a considerable extent by the inhabitants of the Isle of Portland. Living within a short distance of the island, I have thought it desirable to make some inquiries, to ascertain to what extent it is at present carried on. Dr. Pereira probably derived his information principally from an article in the 'Transactions of the Society of Arts,' vol. xv. (1797), in which it is stated that, in the year 1797, the gold medal of the Society was awarded to Mrs. Jane Gibbs, of Portland, for producing a sample of starch, fit for economical purposes, from materials unfit for the food of man. The starch, or arrow-root, as it is usually called, was prepared by her by crushing in a mortar the corms of the *Arum maculatum*, stirring the mass with water, and straining off the liquor, from which the fecula was allowed to subside; this was again washed, and afterwards dried. She stated, and the statement is confirmed by the then Rector of the island, that she had in her possession 2 cwt. of the starch; and was ready to supply any quantity of the same, whenever required, at 11*d.* per lb. Although there is no doubt that the quantity of the starch manufactured was much greater at that time than the present, yet its manufacture was never of much importance. It is now almost

extinct, and the arrow-root never seen out of the island, except in the hands of the curious. From my inquiries, I have learned that, many years ago, it was customary to crop the land only every other year, allowing it to remain fallow in the intervening period; and that in the fallow fields leave was given to the inhabitants to dig for the roots. This custom has been abandoned, and the usual system of rotation of crops introduced. The common, too, of late years, has been much infringed upon by the government, for public purposes, and also by speculators, for quarrying for stone. These causes have very much interfered with its manufacture; so much so, indeed, that a few years since, wishing to procure a sample for a friend, to illustrate a lecture on dietetic articles, I found it very difficult to obtain even half a pound of it. Within the last week I have ascertained that one old woman is the only person who now prepares it; and she gives as her reason for doing so, that 'poor folks, now-a-day, are glad to turn an honest penny any how.' At the present time, the Arum is not very plentiful in the island; although there is still a vast extent of land that will never admit of cultivation, on account of its stony character, which, doubtless, produces most of the small quantity now obtained. With the exception of the old woman previously mentioned, liberty is not now obtained to dig in the cultivated fields and pastures. The Arum maculatum is commonly called arrow-root, or starch-root; but the vulgar names, 'cows and calves' and 'lords and ladies,' are also known, though not so frequently used. The proper season for collecting the corms is when the plant has perfected its growth. This is generally in the months of May and June. Those which are collected in May yield a much less proportion of starch than those collected later. The fresh corm is extremely acrid, producing a most disagreeable tingling and pricking sensation in the mouth, when chewed. This acidity, I found, was not completely removed by toasting. Lindley states that the corms are edible, when deprived of this acidity by boiling; but I have never known them so used. Their acidity renders it necessary to bruise the corms in a stone mortar, and to avoid, as much as possible, handling them until after they have been washed. The process now employed for the separation of the fecula is the same as that described by Mrs. Gibbs. The corms yield, according to Mrs. Gibbs, 4 lbs. of fecula to the peck. My informant tells me she obtains, on an average, 3 lbs. from a peck of corms; more in June, less in May. During the whole season, she considers three dozen lbs. to be a good average quantity to obtain; and for this she asks 1s. 4d. per lb. It is highly valued by the Portlanders,

who say that it is good for sick people, and looks, when prepared, very different from the arrow-root of the shops. I have compared it with Bermuda arrow-root, and find that it does not make either so clear or firm a jelly, but is perfectly inodorous, tasteless, and destitute of colour. The granules, when viewed under the microscope, appear of an irregular spherical shape, varying much in size; but are, on an average, much smaller than ordinary starches, except rice-starch. The hilum is not very distinctly marked, appearing plainly only in the larger granules. The Portland arrow-root is, I believe, only made in the Isle of Portland. Although there is an abundance of the *Arum* on some of the commons near Weymouth, yet the country people do not appear to know that it is of any use. This will doubtlessly appear strange to those unacquainted with Portland; but, when we consider that, until within a few years, the Portlanders have kept themselves, as much as possible, aloof from the rest of the world, even forsaking their friends who dared to marry out of the island, and not permitting a stranger to settle amongst them, we can no longer wonder that they have kept their knowledge to themselves. They are probably a race of entirely distinct origin from the inhabitants of the mainland. Even now they use words which are not understood by us. This arrow-root has been prepared by them from time immemorial; and it is very probable that, living on a barren island, and depending principally on fish, they may have been compelled by necessity, at some time, to seek subsistence by preparing the corms for food. It is a singular fact, that the plant is called arrow-root by the Islanders, perhaps from its sagittate leaves; may not the *Maranta arundinacea* have derived its English name from the previously known and appreciated arrow-root of the Isle of Portland?"

Specimens of the Portland arrow-root, and some fresh corms of the *Arum maculatum*, sent by Mr. Groves, were laid on the table.

The President thought that it was much more probable, that the name arrow-root, as applied to the fecula obtained from the *Maranta arundinacea*, was derived from the circumstance of the pulp of its corm having been formerly applied, by the natives of the West-India Islands, to wounds inflicted by poisoned arrows.

Mr. Penney read an interesting paper on 'The place which Botany should occupy in the Studies of the Pharmaceutist.'

The President then said that, as this was the last meeting of the session, he could not but congratulate the members upon the great success which had hitherto attended them. He hoped that, during

the recess, those members who visited the country would remember, that one of the leading objects of the Phytological Club was the formation of a herbarium of British plants; and that they would accordingly do all in their power, not only to collect plants themselves, to present to the Club, but urge their friends to do the same; by which means he trusted, when they met again in October, he should be able to announce a long list of donations. Mr. Bentley also took this opportunity of again urging on the members the great importance of paying particular attention to the effects of climate, &c., on the medicinal activity of plants. Observations on this subject were much wanted; and he hoped that some of the country members would furnish a paper on this subject, as they alone were in a position to investigate it with any probable success.

DUBLIN NATURAL-HISTORY SOCIETY.

June 10, 1853.—J. R. Kinahan, Esq., in the chair.

Classification, &c., of Ferns.

Mr. Kinahan read a paper ‘On the Classification and Nomenclature of Ferns.’

“When, at the commencement of the session, I submitted to the Society several undescribed varieties of native ferns, I stated that, before the close of the session, it was my intention to offer some remarks on the subject of varieties of ferns. This promise I now propose fulfilling. The rough outline of the system (if I may venture to use such a term) which I am about to bring before your notice, I have already laid before a kindred Society in this city; but, as I have since had opportunities of establishing what then was only surmise, and of fully working out what was then but a rough outline, I hope the present paper may be deemed sufficiently original to be worthy of a place in your Proceedings. In every work on the subject of British ferns we find species described under two classes, *viz.*, the ordinary form, and what authors term varieties, under this term including every departure from the original type, whether it be or be not permanent under cultivation, or affecting the whole plant,—a mere monstrosity, or a doubtful species. This system gives rise to great inconveniences, as the student is often unable to tell whether the plant so described as a variety is (in relation to the original form) to be considered as a form modified by climate, &c., or as a mere deviation from the normal type arising from

some accidental circumstance of soil, situation, &c. A second inconvenience, under the present system, with which students have to contend, arises from the want of fixity of nomenclature; authors having described these forms, even in the same species, under different names, totally irrespective of those used by others who have preceded them. A third inconvenience arises from authors having described the same character of variety, when found in different species, by different names, thereby burdening the student's memory with a host of terms. These evils, doubtless, have, in great part, arisen from this subject not having been studied; it being the fashion with many to consider all monstrosities, *i. e.*, aberrant forms, as outside the pale, and, as such, unworthy the attention of the scientific student; and yet, morphologically considered, they are most interesting, not to say important; often tending to throw light on obscure points in the economy of species. Furthermore, when such men as Linneus, Willughby, and Ray deemed them not below their notice, surely they are not beneath ours. To obviate these inconveniences I beg to propose the following plan:—Let all descriptions of forms of ferns be divided under the following four heads:—1. Form, or original type. 2. Subform, or forms aberrant from some geographical influence, such as climate, &c., and including what are called doubtful species. 3. Subvarieties, or non-permanent monstrosities. 4. Varieties, or permanent monstrosities. Between these last we shall find some very strange analogies; the subvariety often appearing as though it were but a link between the variety and original form. I say appearing, because they never, at least as far as I can find, degenerate into one another; when any change does take place, the subvariety returning to the original type, and the variety either degenerating into some other variety, or else also returning to the original form. To meet the last inconvenience, I would suggest, that to each subvariety, variety, and subform, no matter in how many species found, but one distinctive name be given, defining that name as species and genera are at present defined; so that when we find this form, under any species, we need but to the specific and generic names append this distinctive name, in order to render the identification of it easy, and thereby save ourselves the trouble of repeating with every species a probably long description. 1. Subforms would include all forms of the fern departing in a slight degree from the original type, so as to present tangible differences, and yet approaching it sufficiently nearly to be identified with the species generally prevailing through the entire plants of a district; often returning to the normal form under cultivation, and

bearing spores which produce plants similar to the original type. This class will include what are at present called doubtful species.

2. Varieties would include monstrosities, *i. e.*, aberrant forms, or plants in which the original form of the species is lost, entirely or in part, so as to render identification difficult; found generally in isolated plants, generally permanent under cultivation, uniform, *i. e.*, affecting all fronds of the plant; if fruitful, generally producing plants similar to the parent.

3. Subvarieties, *i. e.*, aberrant forms not permanent under cultivation, always retaining in a great degree the original type, not uniform, nor necessarily affecting the same plant every year, even in a state of nature, and from its spores producing the normal form.

In accordance with these views, I have succeeded in classifying, under the following four heads, all the monstrosities described by authors, as well as many hitherto undescribed. These classes, and their distinctive characters, I now hasten to lay before you, in the following order, using the terms variety and subvariety in the sense I stated just now. I shall describe each analogous variety and subvariety together, not that I believe there is any necessary connexion between them, for the reasons stated before, but merely for convenience' sake. To the first subvariety, I propose to give the name *multifidum*, taking as its type the common hart's-tongue, var. *multifidum*, and including under it those forms, in other species, to which the names *bifidum*, *lobatum*, and *ramosum* have been given. With these I propose to join, as the analogous variety, the form *ramosum*, taking as its type the common hart's-tongue, var. *ramosum*, and incorporating under it those varieties to which the names *crispum*, *viviparum*, *multifidum*, *furcatum*, *dædalea*, &c., have been given by various authors. The definitions of these two will be as follows:—*Ramosum* variety: Rachis divided and subdivided; segments rounded at their edges, and apices generally curled and crisped; midvein terminating in a lash of branches; segments confluent at their edges. Near this must be placed, if not incorporated with it, the two following varieties:—*Furcatum*: Ends of pinnæ, and apex of fronds, split up into segments; segments tasselled; &c. *Nodosum*: Apex of frond having the rachis split up into numerous segments, each terminating in a broad, curled expansion; pinnæ much contracted, and tasselled at their extremities. *Multifidum* subvariety: Rachis divided and subdivided; segments preserving the usual outline of frond, not curled nor crisped, distinct at their edges and extremities; midvein terminating in a point at the extremity of each segment. Both these forms have the following modifications in common:—Rachis either single, or divided so as to present

the appearance of two fronds on the one stalk ; and, second, the ends of the pinnæ divided, as well as the apex of the frond. These will include of described forms :—Common polypody, subvar. *multifidum* and *bifidum*, Newm. (Clare and Dublin) ; male shield-fern, var. *furcatum* (*multifida*), Moore (England) ; lady-fern, var. *ramosum* or *crispum*, Auct. (Ulster and Scotland) ; also (2), *furcatum viviparum*, Steele, *multifida*, Moore (Killarney, *Ogilby* ; Wicklow, *Newm.* ; Clare, *mihi*, Chatsworth, *J. Bain*), and (3), *nodosum*, *mihi* ; green-stalked spleenwort, subvar. *ramosum*, Auct. (Ireland) ; hart's-tongue, var. *ramosum* or *crispum*, Auct., *dædalea*, Koch, subvar. *multifidum* or *lobatum*, Auct. (common in Ireland) ; northern hard fern, subvar. *multifidum*, described by Deakin (common in Ireland), var. *ramosum*, *mihi*, described before this Society, in February, 1853 (Lough Breagh, county Wicklow) ; adder's-tongue, subvar. *ramosum*, Auct. ; moonwort, subvar. *ramosum* of authors. The subvariety is found in a great many species which are unrecorded. I have, in addition to the above, met with it, in this country, in the male, Roth's, and Bree's ferns, *Polystichum angulare* and *P. aculeatum*, lady-fern, wall-rue, black-stalked, sea-side, and maiden-hair spleenworts, *Grammitis*, common brake, and Killarney bristle-fern. In some it is very common ; in others, rare. I found it also in cultivated specimens of *Asplenium fontanum*, and in many foreign species. Next, the variety which, taking the common polypody, var. *Cambricum*, as the type, I propose to call *Cambricum* ; it will include the varieties called *incisum*, *polystichoides*, and *strictum*. The allied subvariety, taking the analogous subvariety of the same fern, *sinuatum*, I propose to call *sinuatum* ; it includes *sinuatum*, *proliferum*, &c. These two I define as follows :—*Cambricum* variety : Frond either smaller or larger than original type ; pinnæ serrated, or irregularly lobed at their edges ; outline rounded ; segments rounded and confluent. This includes two almost distinct types, in one of which we find the parts of the original type in excess ; in the other, we find them contracted. This last corresponds to *strictum*. *Sinuatum* : Pinnæ serrated, and irregularly lobed ; segments pointed and distinct ; frond generally more luxuriant than normal. Under these heads are included the following described forms :—Polypody of oak, var. *Cambricum*, Linn. (said to have been found in Wicklow and Wales), and the subvar. *bifidum*, *Newm.*, *serratum* and *sinuatum* of other authors (common in Ireland) ; maiden-hair spleenwort, var. *incisum*, *Newm.* (Yorkshire) ; hart's-tongue, var. *polystichoides*, Ray (England) ; northern hardy fern, var. *strictum*, Francis (England, and Glenmacross, county Wicklow) ; and the

following undescribed forms :—Male shield-fern, var. *Cambricum*, subvar. *sinuatum*, mihi (common on most rich banks) ; Roth's fern, subvar. *sinuatum*, mihi (Ardmore, in dry situations) ; scaly Grammitis, subvar. *sinuatum* (mihi), Gort. ; hart's-tongue, subvar. *sinuatum*, mihi (Clare) ; angular shield-fern, var. described by me as *viviparum*, in June, 1852, before this Society. These four forms include all the true varieties which I have met with, except one form of the hart's-tongue, *viz.*, undulatum, which may, I think, be referred to the form *Cambricum*, and is a degenerated form of *ramosum*. Subforms, owing to a difficulty in procuring specimens, I have not been as successful in reducing to classes ; though that it can be done I doubt not. I shall content myself, therefore, with laying one before you, which I propose to call abbreviatum ; taking as its type the form of the male fern to which that name has been given. This we find represented in the following species, and define as follows :—Abbreviatum. Subform : Frond contracted in all its parts regularly, the pointed outline of the frond retained. Examples : Polypody of the oak, subform *acutum*, Newm. (Youghal) ; male shield-fern, subform *abbreviatum*, Moore (England) ; prickly shield-fern, subform *lonchitidioides* (Clare and Ulster) ; angular-lobed shield-fern, subform *abbreviatum*, mihi (county Wicklow) ; wall-rue spleenwort, subform *abbreviatum*, mihi (county Clare) ; hart's-tongue, subform *angustifolia*, Auct. (Killaloe) ; lady-fern, subform *abbreviatum*, mihi (Ardmore). I doubt not but other forms might be referred to this class ; *e. g.*, black-stalked spleenwort, var. *obtusum*, Newm., brittle bladder-fern, var. *dentata*, &c. ; but sufficient are quoted to show what I mean. Similarly, I doubt not, most, if not all, the following might be included under one common class :—Incisa, male fern, var. *erosa*, Deakin, *incisa*, Moore ; black-stalked spleenwort, var. *acutum*, Newm. ; brittle bladder-fern, vars. *cynapifolia* and *anthriscifolia*, &c., and numerous others, which, as I do not possess specimens of them, had, perchance, better be passed over.

“ This is a general outline of the system proposed to be introduced. That it is not an unnecessary one will be evident, if we consider the number of these varieties which every day's research brings to light, and the consequent number of descriptions which must be introduced for them into our Floras, the greater part of which may be avoided by pursuing the plan now sketched out. I think the same plan might be pursued in general Botany, with a good effect ; but it is of far greater importance in Filicology, as so many of this class of plants may be recognized by their external form alone. Before

concluding, I will say a few words on the study of varieties. I know it has been urged as an argument against it, that it tends to increase spurious species; but this statement is an error, as the effect of it would be quite the other way, and as nothing can tend so much to do away with spurious species as a study of all the changes species undergo. In the kindred science of Zoology, when we are in doubt about points of economy, we seek them, often, not in the perfect animal, but in the monster. Why, then, should we not, in plants, apply the same rule, and seek amidst the vagaries of monstrosities for the rules which govern regular forms?—for thence can they often be deduced, as by the breach of the law we oftentimes are reminded of its existence. To show that this theory, system, or whatever you will call it, is not unnatural, I have drawn out a table of eight species, in which we find these forms, now described, prevailing in the following ratio:—The species are male fern, hart's-tongue, common polypody, northern hard fern, lady-fern, maiden-hair spleenwort, angular shield-fern, and prickly shield-fern. Amongst these, *ramosum* occurs in the first four; *multifidum*, in the whole eight; *Cambricum*, in the first four and the sixth, *i. e.*, in five; *sinuatum*, in the same five; and the subform *abbreviatum*, in the first, second, third, fifth, seventh, and eighth, six in all. This concludes the subject. Whether my deductions are overdrawn, or not, you can judge for yourselves, as you have before you the greater part of the specimens from which, as the materials, they were drawn. Many of these, however, especially among the subforms, are now very inadequate pictures of what they were when growing, as it is impossible, even by the most careful drying, to preserve many points of importance in distinguishing between the forms. They are all, with very few exceptions, which I have marked, Irish specimens, gathered during the last two years, and therefore fair specimens of the forms to be found in a state of nature."

Mr. Kinahan, in conclusion, gave a tabular view of his proposed classification; detailing the reasons why he considered that the present nomenclature included specific characters that caused confusion.

ROYAL PHYSICAL SOCIETY OF EDINBURGH.

On Bothrodendron, Ulodendron, Stigmaria, &c., and restoration of Sphenopteris elegans.

At a late meeting of this Society the following paper, intituled 'On Bothrodendron, Ulodendron, Stigmaria, and other characteristic Plants

of the Carboniferous Period, with a restoration of *Sphenopteris elegans*, by Hugh Miller, Esq., was read.

The author began his paper by quoting from Mr. Bunbury's description of a fossil fern of the North-American coal measures, published in the 'Journal of the Geological Society' for 1852. "It is rare," says Mr. B., "to find in the ferns of the carboniferous period, even the stipes or leaf-stalk completely preserved down to its base; the only specimen of the kind that I have seen is a beautiful *Sphenopteris* (I believe *Sphenopteris elegans*) from the Edinburgh coal-field, in the collection of Mr. Hugh Miller." What is deemed rare by Mr. Bunbury, one of our highest authorities in fossil botany, must be regarded as absolutely so; and Mr. M. now exhibited, he said, and attempted to describe, this unique fossil, in the hope of adding a very little to what was already known regarding one of the most beautiful and characteristic ferns of the lower coal measures. From a suite of specimen's on the Society's table, it would be found that, save in one particular, the entire frond of *Sphenopteris elegans* could be restored, so as to be rendered as palpable to conception as the fronds of the green brake, which in one respect it resembled, that flourished last season on the sunny hill-sides or amid the deep woodland glades of our country. In one important particular, however, the restoration must be incomplete. So far as Mr. M. knew, no specimen of any coal-measure species of this ancient genus exhibits the fructification; and we must be content, therefore, to acquaint ourselves simply with the general outline and venation of the plant. All previous attempted restorations of *Sphenopteris* had been unfortunate. It seems to have been inferred, from the minuteness of the pinnules, that the frond to which they belonged had also been minute; and so in the restorations, such as that of the late Dr. Mantell, in his 'Wonders of Geology,' and that of the interesting oil painting of carboniferous plants in the Museum attached to the Edinburgh Botanic Garden,—restorations introduced, however, rather for pictorial than scientific purposes,—the large, eminently handsome, and apparently solitary frond given to the plant by Nature, has been represented by mere dwarfish pinnæ, rising gregariously, as in *Polypodium* and *Asplenium*, from a common rhizoma. In one important respect *Sphenopteris elegans* resembled *Pteris aquilina*, our common hill-side bracken. It was furnished with a stout leafless rachis, exceedingly similar in form to that of *Pteris*. Nay, it exhibited so completely, in Mr. M.'s specimen, the same club-like slightly bent termination, the same gradual diminution in thickness, and the same smooth surface, that one accustomed to see this

part of the bracken used as a thatch, and a very durable thatch the stipites of the bracken do form, can scarcely doubt that the stipes of *Sphenopteris* would have served the purpose equally well. Evidently, were it still in existence to be employed for that purpose, a roof thatched with *Sphenopteris*, with its pinnæ and leaflets concealed, and only its club-like stems exposed row above row, in the ordinary style of the fern-thatcher, could not be distinguished, so far as form and size went, from a roof thatched with *Pteris*. At a height of from seven to eight inches above its club-like termination, the stem divided into two equal parts, which shot upwards with a divergence that rendered the fork between an angle of about 30° ; and at unequal heights, a little further up, each of these divided stems bifurcated, in turn, at about the same angle, and then shot up, in some individuals, without further bifurcation; while in others they bifurcated again, and yet again. It is probable that, as in many of the recent ferns, the greater divisions of the plant were constant, while the smaller varied according to the richness of the soil, and the consequent size and degree of development attained by the frond. As in *Pteris aquilina*, there shot out from these main stems numerous pinnæ irregularly alternate, and which, becoming less compound as they approached the top of the plant, passed, in ascending, from tripinnate to bipinnate, and assumed finally the form of more alternately pinnate leaflets. Unlike *Pteris*, however, whose stem remains bare of pinnæ until its larger divisions take place, the stem of *Sphenopteris elegans* sent forth on its opposite sides two decompound pinnæ, the one about an inch, the other about an inch and a quarter or so, below the first fork,—a peculiarity of structure that must have imparted a graceful fulness of outline to the lower portion of the frond, which, had the rachis been bare, it could not have possessed. Alternation, save in the bifurcations of the main, secondary, and tertiary stems, and in the case of a few irregular pinnæ that seem to have been placed opposite, or nearly so, constituted the law that regulated the form of the plant. The pinnæ alternated on the greater stems, the semipinnæ alternated on the pinnæ, and, finally, the minute, closely nerved, spathulate leaflets alternated on the semipinnæ. The entire frond must have been of great lightness and beauty, of a style intermediate, from the slimness of its leaflets and the slenderness of its secondary and tertiary stems, between that of the frond of *Pteris aquilina*, and that of the fully developed sucker of the graceful *Asparagus*. A hill-side clothed with these delicately fronded ferns must have rolled its mimic waves of soft green to every light breeze that stirred the depths of the old carboni-

ferous forests ; and the light and flexile covering which it gave to undulating plain or gentle acclivity, must have contrasted not unpleasantly with the columnar trunks of fluted *Sigillariæ* or scaly *Lepidodendra*, or with the huge rectilinear boles of gigantic *Araucarians*. After several remarks on the numerous so-called species of *Sphenopteris* found at Burdiehouse, most of which Mr. M. regarded as but mere varieties of a single species, he went on to state that he had an opportunity of seeing, about six years before, though but for an instant, the larger portion of a frond of *Neuropteris gigantea*. He laid it open at a pit-mouth near Musselburgh, in a mass of gray shale, sorely split and weathered ; but he could do little more than determine that, like *Sphenopteris elegans*, and the common bracken, it too had a thick bare rachis, and that its pinnæ, like its leaflets, were alternate in their arrangement, when it fell to pieces in his hands. Mr. Miller regretted that, during the glimpse which he enjoyed of this beautiful frond, he failed to remark the order in which the larger divisions of the rachis took place ; he merely saw, from the general effect, that the frond as a whole, balanced on its strong club-formed leaf-stem, was greatly massier than that of either *Pteris aquilina* or *Sphenopteris elegans* ; and that in the clustered richness of its leaflets, although not in their disposition, it resembled our recent *Osmunda regalis*, or royal fern. So transient was his glimpse of the plant, that it has since reminded him of those momentary glances caught, according to tradition, of long-buried monarchs in their sepulchres, that in one moment are seen august in all their robes, and in the next descending before the admitted air into a shower of light dust. Mr. Miller next exhibited and described a very fine, and in some respects unique specimen of *Ulodendron minus*, which he had disinterred from out a bed of ferruginous shale in the Water of Leith, a little above the village of Colinton. Though little more than 10 inches in length by 3 in breadth, it exhibited no fewer than seven of those round beautifully sculptured scars, ranged rectilinearly along the trunk or stem, by which this ancient genus is so remarkably characterized. The specimen is covered with small, sharply relieved, obovate scales, most of them furnished with an apparent midrib, and with their edges slightly turned up ; and from these peculiarities, and their great beauty, are suited to remind the architect of that style of sculpture adopted by Palladio from his master, Vitruvius, when, in ornamenting the Corinthian or composite torus, he fretted it into closely imbricated obovate leaves. These scales are ranged in elegant curves, which one of the members of the Royal Physical Society, Mr. Charles Peach, as his

quick eye caught the arrangement in Mr. M.'s specimen, compared not inaptly to those ornamental curves, a feat of the turning-lathe, which one sees roughening the backs of ladies' watches. Mr. Miller's specimen exhibited, as it lay in the rock, what, so far as he knew, no other specimen of *Ulodendron* had yet shown, a true branch shooting out at an acute angle from the stem, and fretted with scales of a peculiar form, verging from irregularly rhomboidal to irregularly polygonal. It has been shown by Messrs. Lindley and Hutton, on the evidence of one of their specimens, figured in the 'Fossil Flora,' that the line of circular or oval scars, so remarkable in this genus, and which are held to be the impressions made by a rectilinear range of cones, an almost sessile row existed in duplicate, occurring on two of the sides of the plant directly opposite. Its cones were thus ranged all in one plane. The branch struck off from one of the intermedial sides, at what in the transverse section would be at right angles with the cones; and though little can be founded on a single specimen, such, certainly, is the disposition of branch that seems best to consort with such a disposition of cone. It may be added, said Mr. M., that if all the branches were also ranged in one plane like the cones, such a disposition would not be quite without example in the vegetable kingdom, even as it now exists. "Our host," says the late Captain Basil Hall, in his brief description of the Island of Java, "carried us to see a singular tree, called familiarly the 'traveller's friend,'—*Urania* being, I believe, its botanic name. We found it to differ from most other trees, in having all its branches in one plane, like the sticks of a fan or the feathers of a peacock's tail." Influenced, perhaps, by Captain Hall's description, and the figure of *Urania* given in his work, Mr. M. had been accustomed, he said, to think of *Ulodendron*, though his evidence on the subject was still far from ample, as a plant somewhat resembling in its contour the old Jewish candlestick, as sculptured on the arch of Titus. Mr. M. then went on to show that *Ulodendron* was not, as surmised by the authors of the 'Fossil Flora,' a mere form of *Lepidodendron*; though not improbably another of their genera, *Bothrodendron*, was a mere form of *it*. At least, *Ulodendron*, when decorticated, exactly resembles the latter plant, being mottled over with minute dottings quincuncially arranged, and presenting its rectilinear line of oval scars devoid of the ordinary sculpturings. After several remarks on *Lepidostrobus variabilis*, which, as shown by specimens on the table, could not be the cone of *Ulodendron*, as Messrs. Lindley and Hutton had surmised, but was unequivocally, as had been inferred by Adolphe Brongniart, that of *Lepidodendron*, Mr. M.

went on to describe what he deemed a new species of *Stigmaria*, which he had found in Joppa quarry. In the specimen exhibited, the characteristic areolæ of the plant presented the ordinary aspect. Each, however, formed the centre of a sculptured star, consisting of from eighteen to twenty rays, or rather the centre of a sculptured flower of the composite order, resembling a garden daisy,—the minute petals being ranged in three concentric lines. Mr. M. then referred to the discovery by Mr. Binney of Manchester, that the *Stigmaria* are the *roots* of *Sigillaria*, or rather, said Mr. M., the discovery that they occupy the *place* of roots. From a specimen on the table, it would be seen that they terminated very differently from true roots; ending as abruptly as any of the Cactus tribe, and with their bud-like areolæ thickly clustered at the extremities. After arguing the point at considerable length, Mr. M. went on to say that it might, he thought, be consistently held, that while the place and position of *Stigmaria* were, as shown by Mr. Binney, those of true roots, just as the place and position of the rhizoma of *Pteris aquilina*, or of *Cryptogamma crispa*, are those of true roots, it was, notwithstanding, not a true root, but merely a congeries of subterranean stems, that sent forth from the centre at which they converged, a thick subaërial trunk, richly sculptured, and covered with a foliage of which every trace has long since disappeared. There was but one other plant of the coal measures, said Mr. M., to which he would at present call the attention of the Society. It was evidently a fern, but presented at first sight more the appearance of a Cycadaceous frond than any other vegetable organism of the carboniferous age yet seen. From a mid-stem, about a line in thickness, there proceed at right angles, and in alternate order, a series of sessile lanceolate leaflets, rather more than two inches in length, by about an eighth of an inch in breadth, and about three lines apart. Each is furnished with a slender midrib; and, what seems a singular, though not entirely unique feature in a fern, the edges of each are densely hirsute, and bristle with thick, short hair. The venation is not distinctly preserved. In conclusion, Mr. M. took the liberty, he said, of urging on such of the members of the Society as possessed unique fossils of our carboniferous Flora,—unique either from the circumstance of their being positively new, or of throwing new light on the forms or structure of plants already known in part,—the importance of exhibiting and describing them for the general benefit. The authors of both Fossil Floras and Fossil Faunas, however able or accomplished they may be, have often to found their genera and species, and to frame their restorations, when they attempt

these, on very inadequate specimens. For, were they to pause in their labours until better ones turned up, they would find the longest life greatly too short for the completion of even a small portion of their task. Much of their work must of necessity be of a provisional character; so much so, that there are few possessors of good collections who do not find themselves in circumstances to furnish both addenda and errata to our most valuable works on Palæontology. And it is only by the free communication of these addenda and errata that geologists will at length be enabled adequately to conceive of the by-past creations,—of, in especial, the Faunas of the palæozoic and secondary periods, and of that gorgeous Flora of the carboniferous age, with some of whose organisms Mr. M. had been attempting to deal, and which seems to have been by far the most luxuriant and wonderful which our emphatically ancient earth ever saw.

NOTICES OF NEW BOOKS, &c.

‘*The Annals and Magazine of Natural History*,’ No. 66, June, 1853.

This number contains the following botanical papers:—

‘Remarks upon British Plants; by Charles C. Babington, M.A., F.R.S., F.L.S., &c.’

‘On the Genera of the Tribe Duboisæ; by John Miers, Esq., F.R.S., F.L.S.’

‘Observations on Relative Position; including a new Arrangement of Phanerogamous Plants; by B. Clarke, F.L.S., &c.’

‘Researches on the Fecundation and Formation of the Embryo in Hepaticæ and Ferns; by H. Philibert. Extracted from the ‘*Comptes Rendus*,’ Dec. 13, 1852, p. 851.

Mr. Babington’s paper is continued from the previous number, and exhibits the same care and research as before. The genera treated of are *Myosotis* and *Thymus*; and the observations on these are so fully reported in the last number (*Phytol.* iv. 984), that an abstract would be almost tautological.

'The Sea-weed Collector's Guide: containing Plain Instructions for Collecting and Preserving, and a List of all the known Species and Localities in Great Britain. By J. COCKS, M.D., Devonport. London: John Van Voorst, 1, Paternoster Row. 1853.'

It is recorded of some modern Zoilus, that he quaintly characterized a book he was reviewing as containing "many things both new and true;" but then, as a kind of set-off to this modicum of "faint praise," he goes on to say that "the *new* things are not *true*, neither are the *true* things *new*." Now we would by no means be understood to insinuate that the new things in Dr. Cocks's 'Guide' are not true; neither would we quarrel with his true things because they are not new: his little book is indeed confessedly a compilation from standard works of acknowledged high character, and the name of Dr. Harvey is a sufficient guarantee for the intrinsic value of the ample extracts from that gentleman's published works on the British Algæ, which we meet with in many parts of the 'Guide.' These quotations are, we believe, in all cases accompanied by an acknowledgment. Such an acknowledgment, indeed, is no more than the due of an author whose labours are appropriated by followers in the same field of research as himself: it is, to say the least of it, a graceful compliment to those who have cleared the way for their successors, and should in no case be withheld; although, as it appears to us, our author has not in every instance stated the source whence his materials have been derived.

Dr. Cocks gives some plain and useful directions for collecting and preserving the marine Algæ, which will greatly assist the young algologist in the preparation of his specimens. Very few of the directions for drying the Algæ can however be classed among the *new* things of the book; at all events, they bear a very striking family likeness to similar instructions given by Dr. Drummond, in a valuable paper published in the 'Magazine of Zoology and Botany' for 1838 (ii. 144). This likeness is, indeed, so strong, that we can hardly persuade ourselves that they belong to that class of undesigned coincidences which every now and then occur in the writings of independent labourers on kindred subjects. A few of these parallel passages we quote below, premising that we have *Italicised* such phrases as are the more striking from their close similarity, we might say, their identity.

Cocks, 1853.

"*The first step to be taken is to examine each one separately, and carefully remove every particle of extraneous matter that may be attached. These foreign bodies,*" &c.—P. 17.

"Notwithstanding *the pains we may have taken to clean our specimens beforehand, we shall often find, when they are fairly spread out, that there are still some minute particles adhering to them.*" —P. 17.

"These are effectually removed with *a pair of dissecting forceps, which are, * * indeed, almost indispensable in laying out marine Algæ. They will, besides, be found most useful for various purposes difficult to describe.*" —P. 17.

"Now, *the quality of the paper is a matter of considerable importance, * * for it frequently happens that a great error is committed in this respect, not only by the novice, but also by the more experienced algologist, in using paper of a thin and inferior quality, which very much injures the appearance of the specimen.*" —P. 18.

"There are *some species in particular, that contract so much in drying, as to pucker the edges of the paper if it is not sufficiently thick, and these are then seen to considerable disadvantage.*" —P. 18.

Drummond, 1838.

"*The first object to be attended to in preserving marine plants is to have them washed perfectly clean before spreading. There should not be left upon them a particle of sand or other foreign body.*"

"Whatever *pains we may have taken to clean the recent specimens, we shall often find, when spreading them, that some foreign particles continue attached.*"

"And for the removal of these *a pair of dissecting forceps, and a camel's hair pencil of middle size, will be found very convenient. These, indeed, are almost indispensable, and will be found useful on more occasions than can here be specified.*"

"The next thing to be attended to is *the quality of the paper on which the specimens are to be spread; and here a great error is generally committed, in using it thin and inferior, by which, if the specimen be worth preserving, it has not proper justice done to it.*"

"Some *species, too, contract so much in drying, as to pucker the edges of the paper if it be not sufficiently thick, * * ** and this has a very unsightly appearance."

" *This observance serves, also, to give a neatness and uniformity to a collection, not to be accomplished by using papers cut at random, or of casual dimensions.*"
—P. 19.

" We have thus three regular sizes of paper, and *this serves to give a uniformity and neatness to a collection, not to be obtained by using papers at random, and of casual dimensions.*"

These extracts speak for themselves, and require but little comment. Dr. Drummond's paper has been laid under contribution, or it has not. If Dr. Cocks has availed himself of the instructions for drying the Algæ therein contained, he should have said so: if not, this division of his book offers as curious a case of identity of ideas and phrases, as did the famous speech of a certain ex-Chancellor which made so much noise a short time ago.

'The Annals and Magazine of Natural History,' Nos. 67 and 68, July and August, 1853.

No. 67 contains the following botanical papers:—

'Remarks on some Algæ belonging to the Genus *Caulerpa*; by R. K. Greville, LL.D., &c.'

'Description of a New Species of *Rhododendron* from Bootan, in India; by Thomas Nuttall, Esq.'

'Observations on Relative Position; including a New Arrangement of Phanerogamous Plants:—Part IV. On Dorsal Placentation; by B. Clarke, F.L.S., &c.'

'On the Structure of the Leaves of Palms; by M. A. Trécul.

Miscellaneous:—'On the Fecundation of the *Fucaceæ*,' by M. Gustave Thuret (from the '*Comptes Rendus*'); 'Experimental Researches on Vegetation,' by Georges Ville.

M. Thuret states that when the diœcious *Fucaceæ* are kept in a damp atmosphere, "the spores and antheridia are pushed out on the surface of the fronds in great numbers." If kept in separate vessels, the antheridia "emit their antherozoids, which move about with the greatest vivacity;" these movements, which are frequently continued till the next day, gradually diminish in intensity, and on the third day decomposition commences. "The spores remain for about a week without sensible alteration; they then also decompose without further development. Sometimes phenomena resembling germination are exhibited; some of them emit irregular prolongations, but no septa

are formed ;" their evolution, however, proceeds no further, and they decompose like the antherozoids. When the spores and antherozoids are mixed together, germination soon commences, and proceeds rapidly. " If the experiment has been performed on a slip of glass kept constantly near a window, in the same position," nearly all the radicles turn away from the light, and towards the interior of the room. When the antherozoids are in considerable quantity, they are seen to " attach themselves to the spores, crawl in a manner upon their surface, and communicate to them, by means of their vibratile cilia, a rotatory movement which is often very rapid. Nothing is more curious than the appearance of these large brownish spheres [the spores] rolling in all directions among the crowd of antherozoids which surround them." The author failed in his endeavours to fecundate the spores of *Ozothallia vulgaris* (*Fucus nodosus*, *Linn.*) with the antherozoids of *Fucus serratus* and *F. vesiculosus*, and *vice versâ* ; nor was he more successful when he applied the antherozoids of *Fucus vesiculosus* to the spores of *F. serratus* ; but on reversing the latter experiment, he found that some of the spores of *F. vesiculosus* germinated. He does not however venture to conclude from this that hybrid fecundation is possible, but mentions it to call attention to the fact, that whilst " the *Ozothallia* and *Fucus serratus* are very constant in form, *F. vesiculosus* is extremely polymorphous."

No. 68 contains no botanical paper.

Contributions towards the Geographical History of the Plants of Upper Teesdale. By JOHN G. BAKER, Esq.

DURING a recent visit to Teesdale, I have procured numerous notes respecting its botanical productions, and their localities ; but these have been so frequently examined, and recorded in detail, that, with some few exceptions, it will only be desirable to reproduce here those portions of my observations which relate to the geographical area embraced by the rarer species, or extend the limits previously ascertained in this country for those of more general occurrence.*

* The estimates of altitude, in leaps of fifty yards, are based upon the barometric measurements of Professor Phillips, as reported in his new work, ' The Rivers, Mountains, and Seacoast of Yorkshire.' The temperature is calculated according to the rule of Dalton, as in the ' Cybele Britannica ;' assuming the isotherm of 48 degrees for that of the coast-level, and deducting one degree of mean annual temperature for

Thalictrum flexuosum, Reich. Ascends to an elevation of 300 yards (average annual temperature, 45 degrees), along the banks of the Tees, below Holwick, Yorkshire.

Barbarea vulgaris. Ascends to 200 yards (46 deg.), on the banks of the Balder, near its junction with the Tees, Yorkshire.

Erysimum Alliaria. Ascends to 200 yards (46 deg.), on hedge-banks by the roadside near Cotherstone, Yorkshire.

Arenaria serpyllifolia. Ascends to 400 yards (44 deg.), in a cultivated field near Langdon Bridge, Durham.

Hypericum quadrangulum. Ascends to 350 yards (45 deg.), on the roadside near the High-Force Inn, Durham.

Hypericum hirsutum. Ascends to 350 yards (45 deg.), in the wood behind the High-Force Inn, Durham.

Geranium lucidum. Ascends to 400 yards (44 deg.), along the banks of Langdon Beck, near the bridge of the Alston road, Durham.

Prunus spinosa. Ascends to 350 yards (45 deg.), amongst the scars above Holwick, Yorkshire.

Geum urbanum. Ascends to 350 yards (45 deg.), in the High-Force Wood, Durham, with *Poa Parnellii* and *Crepis succisæfolia*.

Agrimonia Eupatoria. Ascends to 250 yards, on the roadside above Romalakirk, Yorkshire.

Potentilla fruticosa. Descends below 150 yards (nearly 47 deg.), at Greta Bridge, Yorkshire, *Baines' Flora*; ascends to 400 yards (44 deg.), on the Durham side of the Tees, near its junction with Langdon Beck.

Sanguisorba officinalis. Ascends to 450 yards (44 deg.), on the lower portion of Falcon Clints, Durham.

Epilobium parviflorum. Ascends to 400 yards (44 deg.), in a streamlet near Langdon Bridge, Durham. Much less hairy than the ordinary lowland state.

Circea lutetiana. Ascends to 200 yards (46 deg.), on a wall near the junction of the Balder with the Tees, above Cotherstone, Yorkshire.

each hundred yards in elevation. To avoid unnecessary repetition, the climatic zone is only mentioned where the species has not been ascertained to occur in the same zone before. As a general rule, the line of 45° (900 feet) may be considered as the boundary between the midagrarian and superagrarian zones in this latitude; and that of 42° (1800 feet) as the upward limit of cultivation. In a few cases, where I have personally collected the species in the specified locality, the authority for its occurrence is given.

Berberis vulgaris. Ascends to 350 yards, in the High-Force Wood, Durham, but possibly introduced.

Saxifraga Hirculus. Ascends to upwards of 600 yards (42 deg.), along the margin of Netherheath Syke, near the Earl of Thanet's shooting-box, Westmoreland, *J. Backhouse, jun.* (Phytol. i. 892). Inferarctic zone.

Peucedanum Ostruthium. In several localities on both sides of the Tees. Though affecting a preference for the vicinity of farm-houses, it may safely be referred to the same category of citizenship as *Myrrhis odorata*. Ascends to 400 yards (44 deg.), near the junction of Harewood and Langdon Becks, at the foot of Widdy Bank, Durham. Superagrarian zone.

Torilis Anthriscus. Ascends to 250 yards (46 deg.), on walls at Mickleton, Yorkshire.

Chærophyllum temulentum. Ascends to 250 yards (46 deg.), along the roadside near Mickleton, Yorkshire.

Sambucus nigra. Ascends to 300 yards (45 deg.), amongst the tumbled rocks and débris below Holwick Scars, with *Allosurus crispus* and *Polypodium Dryopteris*; doubtless a native locality.

Galium cruciatum. Ascends to 300 yards (45 deg.), along the banks of a small stream below Holwick, Yorkshire, with *Melampyrum sylvaticum* and *Equisetum umbrosum*.

Scabiosa Columbaria. Ascends above 400 yards (44 deg.), on the eastern extremity of Falcon Clints, Durham, with *Potentilla alpestris*.

Knautia arvensis. Ascends to 300 yards (45 deg.), on the Yorkshire bank of the Tees, near Lower Cronkley Bridge.

Leontodon hispidum. Ascends to 400 yards (44 deg.), at the foot of Widdy Bank, Durham, with *Carex Persoonii*. Superagrarian zone.

Crepis succisæfolia. Descends to 150 yards (46 deg.), in hedges and meadows between Barnard Castle and Lartington, Yorkshire. Midagrarian zone.

Hieracium pilosum, “*β. subnudum, Fröl.*,” *Fr.*; *H. tricocephalum, Willd.*? *H. Lawsoni, Auct. Ang.* in part. Rocks on the Durham side of the Tees, at Wince Bridge; below the High Force; and at Falcon Clints. Range of elevation, 300—450 yards (45—44 deg.) Sparingly at each station.

Hieracium cerinthoides, *L.* With great difficulty, I procured a couple of specimens from the inaccessible rocks at the White Force, Cronkley Fell, Yorkshire, at an elevation of 450 or 500 yards.

Hieracium iricum, Fr. On both banks of the Tees, and in the bed

of the stream below Wince Bridge, in considerable plenty ; more sparingly higher up the river. Range of elevation, 300—400 yards.

Hieracium pallescens scapigerum, Fr. On the rocks of Falcon Clints, Durham, at an elevation of 400—500 yards. Formerly supposed to be *H. plumbeum*, *Fries* (Phytol. iv. 453).

Hieracium Saxifragum vimineum, Fr. With *H. pilosum*, at the eastern extremity of Falcon Clints, Durham, very sparingly, at an elevation of upwards of 400 yards.

Hieracium murorum, L. ; *H. nudicaule*, *Edmondst.* Rocks on the Durham side of the Tees, below the High Force.

Hieracium cæsium, Fr. On the Yorkshire side of the Tees, below Cotherstone, and near Wince Bridge ; on the Durham bank, near the High Force ; and other localities.

Hieracium vulgatum, Fr. Frequent throughout Teesdale. Var. *medium*, Fr. On rocks in High-Force Wood, Durham.

Hieracium gothicum, Fr. On both sides of the Tees, about Wince Bridge ; and on the Durham side, above the High Force and Langdon Bridge. Range of elevation, 300—400 yards. Var. *humillimum*, Fr., is the most frequent form. Differs considerably from the plant of "Hook & Ockham," Surrey and Kent, distributed under this name last season, through the Botanical Society of London (Phytol. iv. 934).

Hieracium tridentatum, Fr. Ascends to 350 yards (45 deg.), in the High-Force Wood, Durham.

Hieracium crocatum, Fr. The ordinary form of this species, with the vars. *dilatatum* and *angustatum*, Fr., grow plentifully on both sides of the Tees, about the bridges of Wince and Lower Cronkley ; and more sparingly at the High Force.

Hieracium corymbosum, Fr. On the Yorkshire side of the Tees, below Holwick ; about Wince Bridge ; and on the Durham bank, at the High Force and above Langdon Bridge. Range of elevation, 300—400 yards.

Hieracium boreale, Fr. Ascends to 400 yards (44 deg.), with the former, above the bridge of the Alston road, over Langdon Beck.

Serratula tinctoria. Ascends to 300 yards (45 deg.), on the banks of the Tees, at Wince Bridge. Superagrarian zone.

Carlina vulgaris. Ascends to 350 yards (45 deg.), on Force-Garth Scars, Durham.

Centaurea nigra, var. *radiata*. On the Yorkshire bank of the Tees, at Wince Bridge.

Pyrethrum Parthenium. Ascends to 200 yards (46 deg.), on a

wall near the junction of the Balder with the Tees, in company with *Hieracium cæsius* and *Circeæ lutetiana*.

Polemonium cæruleum. Ascends to upwards of 600 yards, in a limestone hollow near the station for *Saxifraga Hirculus*, on the banks of Netherheath Syke, Westmoreland, with *Asplenium viride*, *J. Backhouse, jun.* (Phytol. i. 892).

Mentha aquatica. Ascends to 400 yards (44 deg.), in a streamlet near Langdon Bridge, Durham.

Origanum vulgare. Ascends to 350 yards (45 deg.), in the wood behind the High-Force Inn, Durham.

Stachys Betonica. Ascends to 350 yards (45 deg.), in High-Force Wood, Durham. Superagrarian zone.

Primula farinosa. Ascends to 600 yards (42 deg.), on the summit of Widdy-bank Fell (Black Moor), Durham; and probably higher on the Yorkshire side of the Tees.

Plantago media. Ascends to upwards of 400 yards, on the eastern portion of Falcon Clints, Durham.

Chenopodium Bonus-Henricus. Ascends to 400 yards (44 deg.), near Langdon Bridge, Durham.

Polygonum Bistorta. Ascends to 300 yards (45 deg.), on the Yorkshire bank of the Tees, at Wince Bridge, with *P. viviparum*.

Rumex sanguineus. Ascends to 200 yards (46 deg.), on the roadside near Cotherstone, Yorkshire.

Salix pentandra. Ascends to 450 yards (44 deg.), on the margin of the Whey Sike, Widdy Bank, Durham.

Salix bicolor. In the forms *Croweana*, *Weigelia*, and *nitens*, frequent throughout the superagrarian zone, in Teesdale and Wear-dale.

Allium ursinum. Ascends to 300 yards (45 deg.), along the roadside near Unthank, Yorkshire.

Juncus glaucus. Ascends to 200 yards (46 deg.), along the roadside near Cotherstone, Yorkshire.

Blysmus compressus. Ascends to 500 yards (43 deg.), along the margin of the Whey Sike, Widdy Bank, Durham, in company with the next species.

Elyna caricina. Descends to 500 yards (43 deg.), along the margin of the Whey Sike, with *Bartsia alpina*.

Carex Persoonii, Sieb. Descends to 400 yards (44 deg.), near the junction of Whey Sike with the Harewood Beck, Durham.

Avena flavescens. Ascends to 400 yards (44 deg.), in meadows near Langdon Bridge, Durham.

Festuca pratensis. Ascends to 400 yards (44 deg.), in meadows near Langdon Bridge.

Brachypodium pinnatum. The High-Force Wood, in which this species is reported as growing (Phytol. i. 114), is not, from its geological character and elevated position, a very likely locality to produce it. Possibly the next species, which is conspicuous there, may have been mistaken for it.

Triticum caninum. Ascends to 350 yards (45 deg.), in High-Force Wood, Durham.

Lastrea glandulosa, Newm. In company with the ordinary form of *dilatata* (*multiflora*, Newm.), amongst the débris below Holwick Scars, Yorkshire.

Equisetum variegatum. Ascends, with *E. palustre*, var. *alpinum*, Hook., to 500 yards (43 deg.), on Widdy Bank, Durham.

JOHN G. BAKER.

Thirsk, North Yorkshire,
August 6, 1853.

Notes of a Botanical Excursion down the Wye.

By T. W. GISSING, Esq.

PROBABLY the following notice of a few plants found during an excursion, in the early part of June last, down the Wye, may not be uninteresting.

I will first observe, that at Stroud, Gloucestershire, *Juniperus communis* and *Atropa Belladonna* were growing very abundantly; and that, in passing through Gloucester; I saw several plants of *Diploxaxis tenuifolia*, on an old wall near the cathedral; I afterwards found this plant again, very sparingly, on an old wall about a mile from Clifton. *Cynoglossum officinale* is very common by the roadside all the way from Gloucester to Ross; in fact, it was very common in all the parts of Herefordshire that I visited. At a village called Pencraig, a short distance from Ross, one starved specimen of *Hyoscyamus niger* was growing; and near Goodrich Court, that overlooks the truly serpentine Wye, several tufts of the beautiful *Saxifraga hypnoides* peered from amidst the grass, in full flower. The riverbanks yielded *Armoracia rusticana*. *Thlaspi arvense* flourishes in great profusion in fields about the old ivy-covered ruins of Goodrich Castle. On the Caldwell rocks, part of that wooded ridge crowned by the far-famed Symond's Yat, I observed a few poor fronds of

Polypodium calcareum. As I was "moving on," I had not that opportunity of observing the neighbourhood so closely as I should otherwise have desired. Amongst the grass at the foot of Rhaglan Castle was one plant of *Listera Nidus-avis*; two or three more of these peculiar, withered-looking plants were afterwards seen by the roadside between Monmouth and Tintern. On and near the noble ruins of Rhaglan, ferns are plentiful. Its walls produce *Asplenium Trichomanes*, *A. Ruta-muraria*, *A. Adiantum-nigrum*, *Ceterach officinarum*, *Polypodium vulgare*, and its var. *Cambricum*, in which latter the lobes are frequently bipinnatifid, and *Scolopendrium vulgare*; whilst at their base grew *Asplenium Filix-fœmina*, *Hook.*, *Aspidium Filix-mas*, *A. aculeatum*, and *Pteris aquilina*. Besides these, the woman resident in the castle informed me that a gentleman, lately there, told her that "a rare fern" grew in the keep. I looked very diligently, but failed to discover any other besides the above. I forgot to mention that an old man at Goodrich Castle stated to me, that the adder's-tongue grew plentifully in a wood near; and that ointment made with it was still in use amongst the poor people in that vicinity. It is frequently asked for at chemists' shops in Worcestershire, and is made by the inhabitants in some parts.

From Monmouth I proceeded to Tintern, where, I believe, a botanist might profitably spend a month or two. My stay was short; but amongst the plants I saw were the following:—*Ophioglossum vulgatum* (sparingly in a meadow about a mile from the abbey), *Anthyllis Vulneraria* (on a chalky bank near the base of the Wyndcliff, but I could see it in no other place), *Listera ovata*, *Habenaria chlorantha*, *Lysimachia nemorum*, *Blechnum boreale*, *Cardamine impatiens*, and *Melica nutans* (abundant in most of the woods). *Aspidium dilatatum*, *Rubus Idæus*, *Hypericum Androsæmum*, and *H. pulchrum* occur sparingly in several places. In a wood, locally known as Blackcliff Wood (I presume, from the dingy appearance of the crags that overlook it, and around which the piercing cry of the kite may be frequently heard by day, and the deep hooting of the owl by night), *Convallaria majalis* and *Allium ursinum* grow in such profusion, that, in walking through them, the combined odour of garlic and lily is by no means agreeable. Were it not that, as in most cases, the sweetness predominates over the disagreeable, the pedestrian who had once ventured would, a second time, be more careful in adhering to the beaten path, and thus leave the *perfume* of the garlic to slumber in its cells. So excessively plentiful are the lilies of the valley, that children may be daily met wending their ways to Chepstow, to dispose

of their fragrant bundles to the inhabitants of that town. Likewise, at the gate of the venerable abbey, women, as well as children, may generally be seen, whilst the lilies are in flower, retailing them to such visitors as wish to bear away a Tintern bouquet. In different places in the same wood, amongst *Convallaria majalis*, may be gathered chance plants of *Polygonatum officinale*; but there is great danger of its being eradicated, as it is generally sought to add beauty to the bunches of lilies. *Rubia peregrina* I found in several places in this wood, and *Aquilegia vulgaris* is scattered plentifully through all the woods in the neighbourhood. *Veronica montana* is very common in every wood, and by roadsides. *Vaccinium Myrtillus* and *Berberis vulgaris* are likewise to be found. *Epilobium angustifolium* and *Habenaria viridis* I saw in one spot only. *Euphorbia stricta* still flourishes in its original habitat, and *Geranium sanguineum* covers a rugged rock by the roadside, half a mile on the Tintern side of St. Arvans. A short distance from Tintern Abbey, towards Tintern Parva, I was fortunate enough to discover *Eryngium campestre*, by the roadside, near a manure-heap; two roots only were growing. I believe it has never before been observed in that locality. The Wye, on both sides, from Tintern to Chepstow, is fringed with the white flowers of *Cochlearia officinalis*; and the castle walls, at the latter place, are red with the blossoms of *Centranthus ruber*.

At Chepstow I left the Wye, and crossed the water to Clifton. On St. Vincent's Rocks, I gathered *Ophrys muscifera*, *O. arachnites*, *O. apifera*, *Hippocrepis comosa*, *Chlora perfoliata*, *Arabis stricta* (one specimen only), and *Helianthemum polifolium*. The last-named plant, I believe, has never been seen in this situation before; Brean Downs (Somersetshire), and Torquay and Babbicombe (Devonshire), being the only recorded habitats for it. On the Clifton Downs, at the top of St. Vincent's Rocks, grew *Rubia peregrina*, *Spiræa Filipendula*, and *Geranium rotundifolium*; and, about a mile from the Downs, I found one plant of the *Meconopsis Cambrica*. I looked carefully in every direction, but could find no more.

Numbers of other plants were, of course, growing on all sides; but the above I noticed, as the more uncommon ones.

T. W. GISSING.

44, High Street, Worcester,
August 4, 1853.

Notice of Equisetum fluviatile, Fries, in Britain; and an Inquiry into its Distinctness as a Species. By JOHN G. BAKER, Esq.

DURING the earlier part of the current season, an *Equisetum*, somewhat intermediate in habit between *limosum* and *palustre*, attracted my attention, in a growing state, in this neighbourhood; which, I supposed, might be the plant described by Fries as the *Equisetum fluviatile* of Linneus, and introduced to the notice of British botanists, in the second edition of Babington's 'Manual,' as having some slight claim to be considered a native of this country. Not possessing the means of arriving at a satisfactory decision upon this point, I forwarded a series of specimens of the Yorkshire plant to Mr. C. C. Babington, who, by comparing them with the examples and descriptions published in illustration of *E. limosum* and *E. fluviatile*, by Fries, in the 'Herbarium Normale Suecicæ,'* established its identity with the *E. fluviatile* of Scandinavian botanists, which he has also received from other localities in England and Scotland.

So far as they have come under my observation, the two supposed species, as they appear in this country, may be thus described:—

Equisetum fluviatile, Fries.

Rhizome creeping extensively, closely sheathed, darker coloured than the stem, with numerous bundles of slender, black, fibrous roots issuing from its nodes, and from those of the lower part of the stem.

Stem 3-4 feet high, 2-3 lines thick at its broadest part, fragile, *usually more or less branched, rarely simple*, erect or somewhat procumbent below, or curved above, round or slightly compressed, with 14-18 parallel striæ, divided transversely by numerous closely sheathed articulations, purplish brown and smooth towards its roots, below the sheaths, especially when submerged, light-

Equisetum limosum, Fries.

Rhizome creeping extensively, closely sheathed, darker coloured than the stem, with numerous bundles of slender, black, fibrous roots issuing from its nodes, and from those of the lower part of the stem.

Stem $2\frac{1}{2}$ - $3\frac{1}{2}$ feet high, 2- $3\frac{1}{2}$ lines thick at its broadest part, fragile, *usually simple frequently more or less branched*, erect or somewhat procumbent below, round or slightly compressed, with 14-18 parallel striæ, divided transversely by numerous closely sheathed articulations, purplish brown towards its roots, below the sheaths, especially when submerged, light-green above, when growing quite green,

* Herb. Norm. Suec. fasc. xi. Nos. 97, 98.

Equisetum fluviatile, Fries.

and, when growing, somewhat scabrous above.

Barren stem with 30-45 joints, and a long, lax, slender, branchless, blunt termination; fertile stem with 20-30 joints, frequently overtopped by the uppermost whorl of branches.

Primary sheaths (vaginæ) darker in colour than the stem, more faintly but similarly striated, with rigid, acuminate, purplish black teeth, equalling the striæ in number.

Branches multangular, ribbed like the stem, long and slender, tapering upwards, almost invariably longer than the internodes, usually twice their length, occasionally few in number and irregularly disposed, but more frequently numerous and arranged in lax whorls, spreading at an angle of about 45° with the stem, ultimately somewhat pendulous.

Secondary sheaths (vaginulæ) lax, the upper uniform in colour with the branches, but with their acute teeth tipped with purplish black, the lowest with subobtuse teeth, coloured throughout.

Spike more or less stalked, slender, resembling that of *E. palustre* in size and shape, at first roundish, afterwards ovate-lanceolate, without an apiculus.*

Equisetum limosum, Fries.

smooth throughout.

Barren stem with 30-40 joints, and a comparatively rigid termination, narrowing gradually upwards; fertile stem with 20-30 joints, never surmounted by its branches.

Primary sheaths (vaginæ) darker in colour than the stem, more faintly but similarly striated, with rigid, acuminate, purplish black teeth, equalling the striæ in number.

Branches multangular, ribbed like the stem, short and rigid, nearly equal throughout, usually nearly equalling the internodes in length when matured, arranged in regular erecto-patent ("arrect") whorls.

Secondary sheaths (vaginulæ) lax, the teeth of the upper acute, of the lowest subobtuse, all nearly uniform in colour with the branches, but faintly tipped with purplish black.

Spike nearly sessile, thick, gibbous, black, ovate, blunt.

* For convenience of comparison, I subjoin the notes of Fries, accompanying his illustrative specimens in Herb. Norm. l. c., kindly furnished to me by Mr. Babington :—

The two species are almost precisely alike in their localities and mode of growth. The branched rhizomes, with their matted fibrous roots, creep extensively amongst the mud at the bottom of pools, canals, and slow streams: from these, in the spring, arise a miniature forest of stems, expanding and fructifying as the summer advances, and dying down in the autumn. In habit, *E. fluviatile* is more slender and elongated; *E. limosum*, stouter and more rigid in texture. *E. fluviatile*, both in a barren and fertile state, is usually furnished with numerous long, slender branches, which, in the fully developed and characteristic form, are arranged in lax, irregular whorls, spreading from the stem at a considerable angle; naked stems being nearly as unfrequent as in *E. palustre*. *E. limosum* is frequently, or usually entirely, without branches; when present, they are not nearly so numerous as in the other species, and seldom much exceed the internodes in length: the whorls are consequently less dense, but are more regular, and the branches which compose them only curve slightly at the base, and run upwards almost parallel with the stem. Below the whorls, in *E. fluviatile*, are frequently placed solitary, elongated, lateral branches, which attain a considerable length, and have the internodes conspicuously developed. In the compound form of *E. limosum*, solitary branches are less frequent, and, when present, they are short and blunt compared with those of *E. fluviatile*, and the sheaths approximate closely. The barren stem of *E. fluviatile* is terminated by a long, slender, cord-like extension, entirely without branches, which withers and decays whilst the remainder is still green and vigorous. In *E. limosum* the termination is stronger, and narrows more gradually: when branches are present, they extend upwards higher than in the other species. It was once thought that the differences between grooveless acute, and sulcate blunt ribs, which are conspicuous when the plants are in a dried state, might furnish a distinctive character; but each species varies considerably in this respect. The sheaths at the base of the branches, in both, are similar in shape; but, whilst in *E. limosum* they do not usually differ much in colour from the stem, except at the point of their teeth, in *E. fluviatile* they are invariably coloured

“*Equisetum fluviatile*, L.! Caules toti striati raro nudi, semper heterocladi ramis numerosissimis, laxis, cauda sterili longa laxa fragile terminati. Spica tenuis æstivalis.”

“*E. limosum*, L.! Apud nos in prius vix transit: caules ex magna parte in vivo lævissimi! simplissimi vel homocladi, ramis polygonis arrectis, apice æquales et conformes. Spica crassa atra vernalis.”

throughout. The spike of *E. limosum* is thick, black, and spongy, as is well represented in Newman's figure,* and is usually sessile, the uppermost sheath clasping it like an involucre. It expands earlier in the season than that of *E. fluviatile*, which is smaller in size, more slender and graceful, lighter in colour, and usually elevated from its sheath upon a fragile stalk. In order to afford a more precise idea of the habit and dimensions of *E. fluviatile* than can be conveyed in a general description, I have selected, for purpose of illustration, from a bundle of specimens collected in this neighbourhood, four average stems, which may convey some idea of its leading and most frequent states of variation.

A is a barren stem, measuring fifty inches in length, and, at its broadest portion, when pressed flat, three lines in breadth. It is curved considerably towards the summit, and tapers gradually, the thirtieth internode being exactly half the width of the twelfth. It has forty-one joints, the spaces between which, in its three lowermost quarters, vary in length from one inch to one and a half. All the nodes from the first to the fifteenth inclusive are branchless; the sixteenth has one branch, seven inches in length, with twelve joints; the seventeenth, one; the eighteenth and nineteenth, two each; the twentieth, one; the twenty-first, none; the twenty-second, two; but the remainder are branchless: in all, nine branches, of which the shortest is four inches in length.

B is a barren stem, forty-one inches in length, rather more slender than in the last. It has thirty-six nodes above those from which the roots issue. From the thirteenth of these issues a branch, five inches and a half in length; the fourteenth is branchless; the fifteenth has three branches; the sixteenth, six; the seventeenth, ten; the eighteenth, nine; the nineteenth, two; the remainder are branchless: total, thirty-one branches.

C is a barren stem, fifty inches in length, equalling the first in breadth. It has forty nodes above those from which the roots issue. Of these, the first to the thirteenth inclusive are branchless; the fourteenth has a single slender branch; the fifteenth, one; the sixteenth, eleven; the seventeenth and eighteenth, fourteen each; the nineteenth, twelve; the twentieth, thirteen; the twenty-first, seventeen; the twenty-second, fourteen; the twenty-third, eight; the twenty-fourth, four; the remainder are branchless: total number of branches, one hundred and nine, averaging two inches and a half in length.

D is a fertile stem, measuring thirty-seven inches in length, and, at its broadest portion, when pressed flat, about four lines in breadth. It has twenty-five nodes, the first to eleventh of which inclusive are branchless; the twelfth has two branches; the thirteenth, three; the fourteenth, eight; the fifteenth, sixteenth, and seventeenth, each fourteen; the eighteenth, eleven; the nineteenth, twelve; the twentieth, fifteen; the twenty-first, thirteen; the twenty-second, sixteen; the twenty-third and twenty-fourth, ten each; the twenty-fifth, none: total number of branches, one hundred and forty-two, of which those of the uppermost whorl reach to the base of the spike.

The localities of *E. fluviatile*, so far as they are known to me, are as below. Probably it will be found to be not unfrequent throughout Britain, when it becomes better known, though less general than *E. limosum*:—

Scotland:—Dumbarton? Inverarnar, at the head of Loch Lomond, *C. C. Babington*. England:—(Lake) Lancashire: Silverdale (a polystachion state)! *H. Seebohm*. Yorkshire: Ponds near Thirsk and Topcliffe, abundant!! and near Castle-Howard! *H. Ibbotson*. Cambridgeshire: Ely, *C. C. Babington*.

Now that the *Equisetum fluviatile* of Fries, no longer vaguely “reported as a native” upon uncertain authority, or “ambiguous otherwise,” is clearly ascertained to be an inhabitant of Britain, it becomes desirable to reopen the questions previously brought under discussion in the ‘*Phytologist*’* and to inquire, in the first instance, whether it is distinct, as a species, from the plant of general occurrence throughout Britain, issued by Fries in his *Fasciculi* as *E. limosum*; figured by Smith, in ‘*English Botany*,’† under the same name; and by Newman, in his ‘*History of British Ferns*,’‡ under that of *E. fluviatile*: and, secondly, what is the correct nomenclature of each of the supposed species. To the first question, it is impossible to give a decisive answer; and it is a matter respecting which much difference of opinion may, and probably will, exist. So far as I am aware, in Scandinavia alone have the distinctions between them been clearly pointed out; and consequently the botanists of that country have enjoyed the best advantages for forming a decision respecting them. As has been already explained in the ‘*Phytologist*,’§ we are informed by Fries, in the ‘*Summa Vegetabilium*,’ that although nearly

* *Phytol.* iii. 1, 77, 85. † *E. Bot.* t. 929. ‡ *Hist. Brit. Ferns*, 2nd ed. p. 51.

§ *Phytol.* iii. 3, in an article by Mr. H. C. Watson, defending the correctness of the position of *E. fluviatile* in the second edition of the ‘*London Catalogue*.’

allied, they may be readily distinguished from each other ; and that at the present day they are considered as distinct species, by general consent, in Sweden, although formerly united.* On the other hand, there appears to be a want of positive characters, from which a good specific diagnosis might be framed ; the differences between them being principally in degree, which is probably the cause of *E. fluviatile* having been overlooked in Britain so long. For this reason, specimens somewhat intermediate may occasionally be noticed ;—luxuriant states of the barren stems of *E. limosum*, in which the whorls of branches have become more divaricated than usual, and spring from slightly coloured sheaths, much resembling diminished forms of *E. fluviatile*, when seen singly in a dried state. But, so far as I can judge, when they are fully examined in their native localities, or a sufficient series of characteristic specimens studied when dried, there need not be any difficulty in distinguishing one from the other. But whether the distinctions are sufficiently decisive and permanent in character to separate them as species, must be left for time and more extended observation to determine.†

With regard to the Linnean nomenclature, three alternatives present themselves for our consideration :—

1. That Linneus applied the names “*limosum*” and “*fluviatile*” to the plants described under the *same* names by Fries.

2. That he was unacquainted with *E. fluviatile*, *Fr.*, and applied the two names to the branched and unbranched forms of *E. limosum*, *Fr.*

3. That he was acquainted with both of the supposed species, but united them together ; in the ‘*Systema Vegetabilium*’ applying the name “*limosum*” to the almost branchless form, the “*Equisetum nudum lævius nostras*” of Ray ; and that of “*fluviatile*” to the more compound variety ; but afterwards, finding they were not specifically distinct, omitted the former from the ‘*Flora Lapponica*.’

Of these propositions, the first is decidedly incorrect ; because the

* “*E. limosum* et *E. fluviatile* utique nimis affinia sunt, sed apud nos (circa Upsaliam vulgaris) facile discernuntur et a nullo Botanicorum Suecorum, ad prisca contrahenda quam nova distinguenda promptiorum, conjuncta.”—*Sum. Veg. Scand.* p. 251.

† My large supply of specimens of *E. fluviatile*, and of the variety of *E. limosum* with furrowed ribs, will principally be distributed through the medium of the London Botanical Society. I would respectfully recommend this point to the notice of those who may receive them.

specimens preserved in the Linnean herbarium, labelled "fluvatile," in the handwriting of Linneus, belong to *E. limosum*, *Fr.*

There is a tolerably strong presumption against the correctness of the second alternative, as we are informed that both species are common in the neighbourhood of Upsal; and this is converted almost to a certainty, by the marks of admiration placed after "*E. fluvatile*, *L.*," and "*E. limosum*, *L.*," by Fries, in the Herbarium Normale; which imply that he has seen authenticated specimens, and that they belong to the plants which he describes.

So that the balance of probability appears to favour the view, that each of the names of Linneus and Fries is applied to a series of forms in some degree identical; but that the *E. fluvatile* of the 'Systema Vegetabilium' also includes a common form, or condition, of *E. limosum*, *Fr.* If this view of the case be correct, it will reconcile the apparent discrepancy between the statement of Fries (that he has seen authenticated specimens of *E. fluvatile*, *L.*, and that it is identical with *his* *E. fluvatile*) and that of Newman (that *he* has seen authenticated specimens of *E. fluvatile*, *L.*, and that it is identical with *E. limosum*); or, as it may be more concisely expressed:—

<i>E. limosum</i> , <i>L.</i> , Fl. Lapp.	= <i>E. limosum</i> , <i>Fr.</i> + <i>E. fluvatile</i> , <i>Fr.</i>
<i>E. fluvatile</i> , <i>Fr.</i>	= <i>E. fluvatile</i> , <i>L.</i> Syst. Veg. in part, non Linn. herb. vel Newman.
<i>E. limosum</i> , <i>Fr.</i>	= <i>E. fluvatile</i> , <i>Linn. herb.</i> + <i>E. limosum</i> , <i>L.</i> Syst. Veg.
	<i>E. limosum</i> , <i>Auct. Brit.</i>
	<i>E. fluvatile</i> , <i>Newm.</i>

JOHN G. BAKER.

Thirsk, North Yorkshire,
August 3, 1853.

Medical Properties of British Ferns.

By WILLIAM LAUDER LINDSAY, M.D., &c., &c.

I TAKE the liberty of writing to you on the subject of the use of British ferns in medicine, in consequence of your queries thereanent, contained in the letter lately sent by you to the Phytological Club of the Pharmaceutical Society, and which appeared in a late number of the 'Phytologist' (iv. 976).

Lastrea Filix-mas. This has been repeatedly used, of late, in different wards of this hospital, as an anthelmintic, in the treatment of

tape-worm (*Tænia solium*). It has also been extensively applied to the same purpose by the profession in Edinburgh, and other parts of Scotland. It had fallen into disuse greatly in this neighbourhood, in consequence of supposed inefficiency, but undeservedly so, until Prof. Christison, in two papers published in the 'Edinburgh Monthly Medical Journal,' for June 1852, and July, 1853 ('On the Treatment of Tape-worm by the Male Shield Fern'), showed that the want of success, in some cases, depended on bad preparations of the root, or old roots, being used. He found it almost uniformly successful in the form of an oleo-resinous extract, obtained by percolation of the root with ether. It is recommended in the dose of eighteen to twenty-four grains, followed by a purgative. In many parts of England, nothing is more common as a vermifuge than half a drachm to a drachm of the powder of the root, made up in the form of electuary, with a little treacle or jelly; in other parts of the country, the oil of the male fern is an equally common nostrum. But in neither of the latter conditions can its action be relied upon, especially if purchased in the shops of druggists, who generally not only sell old roots and bad preparations, but some the roots of totally different species. It is most apt to be, and has most frequently been, confounded with *Athyrium Filix-fœmina*, the root of which it has yet to be proved has a similar virtue. If time permit, in the course of this summer, I intend making a series of experiments, to determine whether the same anthelmintic, or what, properties reside in the roots of other of our common ferns. This fern was first used at Genève, by Peschier, some twenty or thirty years ago, in the form of an ethereal extract; but it appears to have been recommended as a vermifuge by Theophrastus, Dioscorides, and Galen; and it formed the chief part of Madame Nouffer's celebrated remedy for the tape-worm. It does not appear to be accurately determined on what special ingredients of the root its vermifuge property depends: we know it contains tannic and gallic acids. There is some contrariety of opinion as to the proper period of the year for collecting the plant for use; Peschier regarding it as most effectual if gathered between May and September, and Prof. Christison considering the date of collection immaterial. The only caution necessary in using it is, probably, that it ought always to be had *fresh*; if gathered and prepared by the practitioner himself, so much the better. The oleo-resin, however, seems to retain its properties for a considerable time; though what this period accurately is, still remains *sub judice*. It has been found quite efficient after being kept a year (Prof. Christison, *loc. cit.*) Prof. Christison commends it as a less disagreeable

and more efficient anthelmintic than the "Abyssinian Kouso, the Continental Pomegranate, or the American Turpentine. It is surprising that Peschier's observations, made on a very large scale indeed, have attracted so little attention in Britain." Dr. Küchenmeister recently made a number of experiments on the relative value of vermifuges in common use, by immersing living worms in albumen, at a temperature above 77° Fahr., and adding the anthelmintic. He found *Tænia crassicollis*, thus treated with the ethereal extract of the male fern, died in two hours and three quarters,—a longer period, however, than in the case of Kouso (*Brayera anthelmintica*, an Abyssinian rosaceous shrub).* Pereira gives an excellent article on this fern (in his 'Materia Medica,' vol. ii. part 1.), which may be referred to for particulars as to the chemistry of the root. *Vide*, also, Christison's 'Dispensatory,' Royle's 'Materia Medica,' Graves' 'Hortus Medicus,' and other works on medical Botany or pharmacopœias.

With regard to other ferns and their allies, these, like most indigenous plants, appear at one time, and that not long gone by, to have held a high place, either in professional or domestic medicine; and notes of their applications in this respect are to be found in a great number of local Floras, and in works on medical Botany, medical journals, &c. *Vide*, for instance, Burnett's 'Outlines of Botany,' Pereira's 'Materia Medica,' Lightfoot's 'Flora Scotica,' and Smith's 'English Flora.' They appear, however, to be little, if at all, used at the present day. I shall briefly glance at the alleged properties of a few.

Adiantum Capillus-Veneris. Ray, in his 'Historia,' attributes every possible virtue to it, on the authority of a Montpellier physician. Its frond is still sold in some shops, for the purpose of making the agreeable beverage called "capillaire," which, however, usually contains *no* *Adiantum*, but is made of "clarified syrup, flavoured with orange-flower water." It is slightly astringent, and was recommended in pulmonary complaints. Like most ferns, it contains tannic and gallic acids; but its properties are, in all probability, *imaginary*.

Aspidium. Various species have been supposed possessed of certain properties, and were formerly officinal in some of the English provinces, and included in some of the Continental pharmacopœias (Burnett).

* *Vide* 'Association Medical Journal,' July 8, 1853, and February 11, 1853; 'Dublin Quarterly Journal of Medical Science,' February, 1853; Froriep's 'Tagsberichte über die Fortschritte der Natur-und Heilkunde. Pharmakologie.' Band i. p. 317.

Asplenium Trichomanes was formerly used as an expectorant by the peasantry of Scotland, but is rarely found in shops (Lightfoot).

Asplenium Ruta-muraria, Lightfoot says, was once sold as an expectorant and deobstruent; and the same authority states that

Asplenium Adiantum-nigrum was sold as a pectoral.

Botrychium Lunaria. Its virtues are probably imaginary only, and due to its supposed resemblance to the moon. Ray stated, on Needham's authority, that an ointment made of it, rubbed on the loins, in dysentery, is very effectual in stopping the attack (Smith). It was also used as a vulnerary (Lightfoot).

Ceterach officinarum was the "Chetherak" of Persian physicians. Greatly commended in jaundice, and splenic diseases (Burnett and Lightfoot).

Equisetum arvense is said to be astringent and diuretic, and various species have been praised as diuretics (Burnett and Lightfoot).

Lycopodium clavatum is emetic in decoction. Its sporules were formerly greatly used by druggists, for covering pills; and physicians were also in the habit of using them, for dusting over excoriated surfaces in children, and in erysipelas, eczema, and similar diseases. They are essentially absorbent and desiccant, and have been said also to be diuretic (Pereira and Smith).

Lycopodium Selago. Its infusion is powerfully emetic and cathartic; hence its use as a cathartic, emmenagogue, and abortifacient. In large doses, it is a narcotico-acrid poison, causing giddiness, convulsions, and death. It is used by the Scotch Highlanders as a counter-irritant and detergent (Pereira, Smith, and Lightfoot).

Osmunda regalis. Its root is astringent, and hence styptic and tonic, and is vaguely supposed to be "strengthening and healing." It was formerly used in rickets; now probably quite abandoned (Burnett and Smith).

Ophioglossum vulgatum was recommended as a vulnerary, in the form of ointment, applied to fresh wounds, by Mathiolus, Tragus, &c. (Lightfoot).

Polypodium vulgare is the "rheum-purging Polypody" of Shakespeare. The powdered root was formerly used, externally, as an absorbent, and for covering pills. In domestic medicine, this plant was also used as an expectorant. The ancients attributed to it cathartic properties.

Pteris aquilina is very astringent, containing a considerable amount of tannic and gallic acids; hence it has been greatly used as an anthelmintic. Lightfoot states that the Scotch peasantry use it, in powder,

as a vermifuge (1777); and “look upon a bed of the green plant as a sovereign cure for the rickets in children.” The ancients used a decoction of the root as a diet-drink.

Scolopendrium vulgare is also astringent; hence it has been used, in the form of ointment, as a vulnerary (Lightfoot and Smith).

To enter more minutely into your queries:—

1. I have shown that, at least, *one* species is used in medicine, at the present day, to a very considerable extent; and it is very probable that other ferns, having similar astringent properties, are employed as vulgar nostrums in many of the more remote parts of our Island.

2. The *species* used (above referred to) is undoubtedly the *Lastrea Filix-mas*; though it is very probable that, in shops, the roots of other ferns, and especially *Athyrium Filix-fœmina*, are substituted for it; thus partially accounting for the great variety observed in its action in the hands of different practitioners. The ferns which most resemble this *Lastrea* in chemical constituents, and are therefore most likely to possess similar therapeutic powers, are *Pteris aquilina*, and various species of *Lastrea*, *Polypodium*, and *Asplenium*. But this I hope soon to make the subject of experiment.

3. I have shown that many species are useful, and might become more so, on account of the large quantity of tannic and gallic acids they contain; hence their astringency and anthelmintic powers. From their also containing considerable amounts of starch, sugars, and gums, fixed and volatile oils, and bitter extracts, I am satisfied that a large proportion of our indigenous ferns might be made available in therapeutics, as tonics, styptics, astringents, vermifuges, and demulcents. The virtues attributed to some species, however, are purely imaginary, and directly traceable to “ancient predilections;” *e. g.*, *Botrychium Lunaria* and *Adiantum Capillus-Veneris*.

4. It is exceedingly difficult to determine this point; but it is probable the use of the *Lastrea*, as an anthelmintic, will *increase*. There appears to be a tendency at the present day to give a due amount of credit to indigenous plants for their curative powers, as depending on ascertained chemical properties. It has too long been the habit of pharmacutists and medical men, of this and other countries, greedily to accept everything *foreign*, that is lauded for its supposed virtues, and add it to their *Materia Medica*; entirely overlooking the more humble and more despised, in consequence of being more easily attainable, denizens of our woods, fields, and moors, which, nevertheless, probably possess equally useful properties. In this respect,

it seems to me that the so-called "ignobile vulgus" show an example to "the profession:" they find the buckbeans, tormentils, and gentians, which grow in all their moors, equally serviceable, as astringents and tonics, with the Catechus, Kinos, and Quassias of distant lands. It is to be hoped that now, however, medical men, no less than botanists, will see floral treasures in every roadside of our own country.

WM. L. LINDSAY.

Royal Infirmary, Edinburgh,
July 29, 1853.

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-eighth Sitting.—Saturday, August 27, 1853.—MR. NEWMAN, President, in the chair.

The President read the following communication:—

Monstrosity of Medicago maculata.

"Mr. Sprague, Fellow of St. John's College, has placed in my hands a monstrosity of *Medicago maculata*, gathered by him, on August 8, near Cambridge. It consists in a change of the usual cochleated and spinous pod of that plant into one of a falcate shape, and quite unarmed. These pods are about three quarters of an inch long, linear, but narrowing gradually at the end into a subulate beak. They are laterally compressed, have many ovules, and are curved backwards so as to form a segment of a circle of greater or less extent.

"As some proof is requisite that a plant producing such very different pods is really a state of *M. maculata*, it is a fortunate circumstance that, in one instance, a single pod of the proper shape and structure belonging to that species is attached to the specimen. It seems to have been one of the first pods produced by the plant, as it is nearly, or quite, ripe, and placed near to the bottom of the stem."
—Charles C. Babington; August 10, 1853.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, July 14, 1853.—Professor Balfour, President, in the chair.

Donations to the Society's herbarium were announced, from the Oregon Botanical Association (valuable specimens of plants, recently received from Mr. Jeffrey, their collector), and from Mr. Alex. O. Black (a parcel of British plants).

The President announced that a new part of the Society's 'Transactions' was expected to be ready for distribution in the course of a few days.

Dr. Balfour exhibited a number of donations recently made to the Museum of Economic Botany, at the Botanic Garden.

Dr. Balfour mentioned the following localities for rare plants in the neighbourhood of Edinburgh:—*Hordeum maritimum*: Kincardine, in abundance (Mr. Robert Carr). *H. pratense*: Kincardine (Mr. John G. Cunningham). *Alopecurus agrestis*: abundant near North Berwick (Mr. J. Lockhart Morton). *Petasites fragrans*: in immense profusion in a wood near North Berwick. *Alyssum calycinum*: Arthur's Seat (Mr. G. R. Tate, and Mr. G. Lawson, jun.) *Mimulus luteus*: near Lanark (Mr. John Cleland). *Marrubium vulgare*: Gosford Links (Mr. Cropper). *Carex aquatilis*: near Lanark (Mr. W. O. Priestley). *Sedum dasycphyllum*: roadside near Queensferry (Miss Lambie). *Trientalis europæa*: near West Calder (Mr. Soubki). *Equisetum umbrosum*: near Garrion Bridge, on the Clyde (Mr. John Ross).

Mr. G. Lawson exhibited specimens of a collection of Fifeshire mosses, proposed to be published by Mr. C. Howie, who, in conjunction with Mr. A. O. Black, had carefully investigated the cryptogamic Botany of the East of Fife.

Dyeing Properties of Lichens.

A paper by Dr. W. Lauder Lindsay, intituled 'Experiments on the Dyeing Properties of the Lichens,' was read.

The author observed:—"It has appeared to me interesting to discover, by a series of simple chemical experiments, the possible applicability of a large number of native species of lichens to the art of dyeing and colouring; and for this purpose I have made, during the last two years, the experiments comprehended in the table now laid before the Botanical Society. Such an inquiry is, however, not only

scientifically interesting ; but it may come to be an important matter, in a pecuniary point of view, to discover, at home or abroad, some cheap and easily procurable substitutes for the Roccellas, which are rapidly becoming scarce, and consequently valuable, in European commerce. The results of my experiments are not so satisfactory as I could have wished, owing to the comparatively small number of fresh specimens operated on ; still, I think, they will sufficiently indicate that we have in Scotland a large number of species capable of yielding excellent colouring matters, in every probability capable of supplanting, or vieing with, the Lecanoras, Gyrophoras, Umbilicarias, &c. (which are at present largely collected in Norway and Sweden for the London market), or even with the Roccellas. It is not for me, at present, to say on what chemical changes the various re-actions I have laid down depend ; whether all, or how many, of these colours can ever become serviceable to the dyer, or otherwise, and, if so, by what processes. These and similar questions I leave it for the chemist, dye-manufacturer, and dyer to decide ; meanwhile, merely indicating facts.

“ The greater number of the lichens operated on are herbarium specimens, collected, several years ago, in various parts of Switzerland, Scotland, and the Vosges district ; a few are natives of Norway, Germany, and other foreign countries.

“ The re-agents used for the development of colour are only intended to be applied to those lichens which contain colourless principles, capable of conversion, by chemical metamorphoses, into coloured substances. They are chiefly adapted to the evolution of a red colour, which is the most important yielded by the lichen family. Where the thallus contains abundance of colouring matters ready formed, these are soluble in almost any fluid ; and ammonia or hypochlorite of lime have not a more specific action on them than water.

“ In order to attain some degree of uniformity in the nomenclature of the colours obtained in these experiments, especially those produced by ammoniacal maceration, I have designated the more marked tints according to Werner’s celebrated nomenclature of colours, as contained in the little work edited by Syme.

“ In the ‘ Table of Experiments,’ the 1st column contains the botanical name, and, in many cases, the synonym, of the lichen operated on.

“ The 2nd column contains generally the country of which the plant is a native, and more particularly the nature of its habitat.

“ The 3rd column contains the date of collection of the plant. It

will be noticed, where several specimens of the same species, which have been collected at different dates, have been operated on, the results vary considerably.

“In the 4th column is given the colour, or character, of the alcoholic decoction of the lichen, which is usually previously comminuted, or pulverized, in order the more fully to expose it to the action of solvents and re-agents.

“The 5th column exhibits the colorific effects, on the alcoholic decoction of the plant (*i. e.*, the solution of its colorific principles), of a weak solution of bleaching liquid, sufficiently strong, however, to be pungent. This is merely a solution of the common bleaching lime, or chloride of lime, and may be considered essentially a solution of hypochlorite of lime, which is its active constituent.

“In the 6th column is shown the effect of weak aqua ammonia on the alcoholic decoction; a sufficiency being usually added to render distinctly ammoniacal the mixture, which is then allowed to stand for one or two days.

“The 8th column exhibits the colours obtained by macerating lichens in a weak ammoniacal solution (of sufficient strength, however, to be distinctly pungent), for periods varying from one month to two years.

“In the 7th column are comprehended a few miscellaneous remarks, chiefly, *first*, on the use of various native lichens in dyeing, by the peasantry of Britain and other countries; and, *secondly*, on the use of various exotic and native species in the manufacture of orchil, cudbear, and litmus.”

Cryptogamic Plants of the Neighbourhood of St. Andrews.

A paper by Mr. Alexander O. Black, ‘On the Cryptogamic Plants of the Neighbourhood of St. Andrews,’ was read.

The author stated that a residence in St. Andrews, during the last eighteen months, had given him an opportunity of investigating the vegetation of a part of our island, hitherto but little explored by botanists. Having devoted much attention to the Cryptogamic orders in general, but more particularly to the ferns and mosses, he thought that the result of his researches might, perhaps, be useful in illustrating the local distribution of these plants.

But few of the hills rise to the elevation of even 500 feet, and these are not unfrequently entirely cultivated: for this reason we find Fife much less prolific in alpine plants, than several counties situated further South; while its northern position effectually excludes all, or

nearly all, lowland plants. The soil is more or less sandy throughout the whole East of Fife, and generally (especially to the North) very dry, there being but one marsh, the Peat-Inn Bog, in the Largo-ward; that, however, is of considerable extent. A large sandy plain, about twelve miles in length, by about five in breadth at the widest part, stretches north of St. Andrews. This is divided into the 'Tents' Muirs and St. Andrews Links, by the river Eden. The former would prove, beyond a doubt, a very rich botanic station; it bears a great resemblance to the well-known Sands of Barry, in the adjacent county of Forfar; and on it, Mr. Black stated, he had already met with the majority of rarities found there; such as *Carex incurva*, *Juncus balticus*, *Cochlearia danica*, *Teesdalia nudicaulis*, *Cerastium tetrandrum*, *Sagina maritima*, *Radiola Millegrana*, *Gentiana Amarella*, *Veronica Anagallis*, *Blysmus rufus*, *Equisetum variegatum*, var. *arenarium*, *Weissia nigrita*, *Didymodon inclinatus*, &c; in addition to which, it produces several plants unknown on the Barry Links, and two not at present found in Forfarshire; viz., *Anagallis tenella*, *Linn.*, and *Lycopodium inundatum*, *Linn.*

The following plants were noticed, as having their petals changed from other colours to white:—*Cakile maritima*, *Viola canina*, *Erodium cicutarium*, *Astragalus hypoglottis*, *Scabiosa succisa*, *Carduus lanceolatus* and *C. palustris*, *Lychnis Flos-Cuculi*, *Campanula rotundifolia*, *Calluna vulgaris*, *Erica cinerea* and *E. Tetralix*, *Galeopsis Tetrahit*, *Thymus Chamædrys*, *Primula vulgaris*, *Gymnadenia conopsea*, and *Orchis mascula*.

Mr. Black then gave a list of the Equiseta, ferns, and Lycopodia found by him, which included *Equisetum umbrosum*, *Polypodium Dryopteris* and *P. Phegopteris*, *Allosorus crispus* and *A. fragilis*, vars. *cynapifolia* and *dentata*, *Polystichum aculeatum*, var. *lobatum*, *Lastrea Oreopteris*, *L. Filix-mas*, var. *incisa*, *L. dilatata*, var. *nana*, *L. spinulosa*, and *L. Fœnisecii*, *Athyrium Filix-fœmina*, vars. *incisum*, *trifidum*, and one approaching *latifolium*, *Blechnum spicant*, *Scolopendrium vulgare*, *Asplenium marinum*, *Botrychium Lunaria*, *Ophioglossum vulgatum*, *Lycopodium inundatum*, *L. alpinum*, *L. Selago*, and *L. selaginoides*. He had found, in all:—Equiseta, 11 species and varieties; Filices, 32; Lycopodia, 5; Musci, 170.

Mr. Black stated that it was his intention, had he remained in Fife, to have compiled a Flora of the county, which is, in the meantime, interrupted; but he hopes to renew his researches in Fifeshire, as well as in other parts of Scotland.

Hardiness of certain Coniferæ.

A paper by Mr. W. W. Evans, intituled 'Remarks on the Hardiness of certain Coniferæ, as shown by the effects of the past winter,' was read.

The author, after making some introductory observations, observed:—"Among the junipers mentioned as 'killed' in Messrs. Lawsons' nursery, are *Juniperus Bermudiana*, *J. flaccida*, *J. Mexicana*, and *J. Sophora*; and on referring to page 261 of the 'Gardener's Chronicle,' I find that *J. Bermudiana*, *J. Bedfordiana*, and *J. religiosa* are reported as 'killed' in Wiltshire. The only one of these tried in the Experimental Garden was *J. religiosa*, which was very much injured, especially on the side next the north-east, although partially protected with spruce branches. Again, in Mr. Robertson's list, *Cupressus macrocarpa* and *C. funebris* are stated to be 'healthy and fresh;' while *C. Goveniana* and *C. thurifera* are reported as 'completely killed down to the roots.' On the other hand, at Boynton, near Bridlington, on the east coast of Yorkshire, and at Nostell Priory, near Wakefield, *C. macrocarpa* is stated to be 'very much injured by the frost;' while *C. funebris* 'seems perfectly hardy,' 'not having been injured in situations where the others mentioned have been.' In the Horticultural Society's Garden, a plant of *C. macrocarpa*, four feet high, remained perfectly green and uninjured; but a smaller plant of *C. funebris*, nearly in the same situation, had to be removed in the spring, the whole of the north side being killed; this plant was also slightly protected by branches. *C. Goveniana*, in the same locality, but unprotected, was killed to the ground, as was *C. Udheana*. *C. thurifera* was not tried. It appears that *C. Goveniana* was uninjured at Chiswick, although much hurt at Kew. It is stated to have been killed at Dublin, and totally uninjured in Cambridgeshire. It was completely killed in Messrs. Lawsons' nursery, as before mentioned; while in Messrs. Dickson & Son's nursery, on the opposite side of the road, and within a few hundred yards, a fine plant escaped unhurt. From the foregoing examples, it appears to me that something more than a mere list of the 'killed and wounded' is required, before we can come to anything like a correct opinion as to the hardiness of newly introduced plants; and that it is of the utmost importance that all such lists should be accompanied by meteorological observations, the distance from, and height above, the sea, exposure, size of plants reported on, and how long planted; and observers, in all parts of the

country, should be invited to send in such reports to some central point, where they could be generalized, and the results made public."

Cones on Pinus Lambertiana.

A paper by A. G. Spiers, Esq., of Culcreuch, intituled 'Notice of the Production of Cones, in 1851, on *Pinus Lambertiana*,' was read.

The tree on which the cones were produced was stated to be about 23 feet in height. The cones contained perfect seeds, from which young plants have been raised.

Mr. M'Nab stated that several plants of *Abies Morinda* were fruiting this season, in different situations; viz., at Riccarton, Dysart House, and the Botanic Garden. He mentioned that all these plants had grown in the Botanic Garden, and had been transplanted last year. The large plants of the same pine, which had not been transplanted, showed no symptoms of flowering.

Measurement of Trees in Gurhwal and Kemaon.

A paper by Mr. John Strachey, C.S., intituled 'Measurement of Trees in Gurhwal and Kemaon, in 1852' (communicated by Major Madden), was read.

Major Madden stated that he had received this communication from Capt. Richard Strachey, with permission to make what use of it he thought best. He therefore laid it before the Botanical Society, thinking it might be interesting to have some actual measurements, by a careful observer, of Himalayan trees, some of which are now being so largely introduced into Britain.

Of one example of *Cedrus Deodara*, growing at an elevation of 8000 feet above the sea, the author says, it had "a perfectly sound, straight, single trunk. At 40 feet from the ground, I tried to measure its girth, but could not manage it; but I convinced myself that, at that height, it must be more than 20 feet round. This is a wonderful tree."

The author remarks of eleven examples of *Cupressus torulosa*, at elevations of from 7500 to 8000 feet, that they "are in a grove of several hundreds, all within a few hundred yards of each other, doubtfully indigenous; but cypress is common all about here. The whole of them are most magnificent. I measured many more than these. Trees of from 18 to 20 feet abound, and I therefore do not put them down. All these are quite sound; most of them single trunks to the top. No. 1 divides into two great trunks, from 20 to 30 feet from the ground, and is a wonderful tree; No. 2 divides into two great trunks, near the base; No. 3 is a single trunk. No. 1 is close

to the great Deodar. The height of these cypresses is most probably more than 200 feet."

Osseous Legumen of Hymenæa Courbaril.

A paper by Dr. Seller, intituled 'Notice of the Osseous Legumen of the Hymenæa Courbaril,' was read.

"The osseous indehiscent legumen of the Hymenæa Courbaril, now exhibited, attracted more notice from the first writers on Carpology than it obtains from those of recent date. As a mere cabinet curiosity, it became prized at no long period after the discovery of America. It is supposed to be referred to by Oviedo, the contemporary of Columbus, and the earliest author on the Natural History of the New World.

"In 1585, this legumen was sent, as a curiosity, to De l'Ecluse, then Director of the Botanic Garden at Vienna, by John Garetus, an apothecary of London. De l'Ecluse, or Clusius, the name by which his fame is perpetuated in the genus *Clusia*, and the natural family *Clusiaceæ*, has given, in his work on exotics, published after he became Professor of Botany at Leyden, a good figure of this legumen, and a distinct description of it, under the name of '*Lobus Wingandecaon*,' from the place whence it was supposed to have come. Clusius seems to think that this pod had been brought to London by some of the followers of Sir Walter Raleigh.

"John Bauhin, in his '*Historia Plantarum Universalis*,' refers to the description given by Clusius, saying, he had been presented with a specimen of this pod, by Frederic Duke of Wurtemberg, whose physician he was at that time. He also gives a good figure of the pod and seeds, along with the figure of a young plant, which, he says, the Duke had caused to be raised from the seed. The leaves of this young plant enable us to identify the pod, figured by Bauhin, with that of the *Hymenæa Courbaril*.

"In 1658, the '*Historia Naturalis Utriusque Indiæ*' was published, by Piso, or Pison, whose name is perpetuated in the genus *Piso*, of the family *Nyctagineæ*. Piso was a physician of Amsterdam, who accompanied Prince Maurice to the New World. Piso gives a description of the tree and the fruit, and figures the legumen, and a branch. The flowers he could not obtain, owing to the great height of the tree. He confirms the conjecture, long before entertained, that this pod belongs to the tree affording the gum anime, now called the *resina animes*. He calls the tree '*Jetaiba*,'—a name seemingly derived from what he gives as the Brazilian word for the gum anime, which is

‘*Jetica-cica*.’ Up to this time, no name for the tree appears to have been known in Europe. The name Courbary, or Courbaril, occurs first among French authors, as in Du Tetre, a French missionary’s history of the French West-India Islands, published in 1654, and in Rochefort’s history of these Islands, published in 1681.

“Ray, in his ‘*Historia Plantarum*,’ published in 1686, copies the description of Piso. Ray had got a specimen, without seeds, from Doody, who was Superintendent of the Gardens at Chelsea. Doody supposed it had come from Antigua. Ray tells us that the plant was reared in Bishop Compton’s garden, at Fulham, whose name is deservedly remembered by botanists in the *Comptonia asplenifolia*, of the order *Myricæ*. That Bishop Compton’s plant was really the *Hymenæa Courbaril*, appears from the figure of a branch given by Leonard Plukenet, in his ‘*Phytographia*,’ who says he got the branch from the Bishop’s plant. Plukenet’s ‘*Phytographia*’ was published in 1691. It contains, also, a good figure of the legumen, and of the seeds. He calls the tree ‘*Ceratia diphyllus Antigoana*.’ He says it is called the locust-tree in the West Indies, because the pod contains a sweet pulp, like the carob, or fruit of the locust-tree of Europe.

“In 1703, Plumier, the greatest botanist of the New World, according to Linneus, described the *Hymenæa Courbaril* with exactness, under the name ‘*Courbaril bifolia*.’

“The tree has since been described by many authors, and figured by a considerable number. Among these, are Browne, in his ‘*History of Jamaica*,’ and Jacquin, who, though his great work on American plants was published near the middle of last century, lived an honoured life nearly to our own times.

“The supposed medical virtues of the *resina animæ* kept up attention to this legumen, not less than its own singular character as a pericarp, throughout the seventeenth and eighteenth centuries; and when I remark that it has met with less attention in later times, I merely refer to the omission of it in the ordinary descriptions of the legumen in modern works on Carpology, which omission is, at least, to the extent that one tries in vain, by consulting our common books, to discover what this fruit is.

“Gaertner, however, has given a very complete description of this pod and the seeds, of which I give a portion in English:—

“‘The legumen large, ligneous, thick, oblongo-reniform, becoming thicker towards the outer extremity, and obtuse, unilocular, valveless, filled with a dry pulp. The pulp exactly filling the cavity of the legumen, externally sprinkled with a red powder like brick-dust,

within white, fungous, resolvable into innumerable linear processes (philyras) resting very closely on each other, and, besides, divisible into as many separate portions as there are seeds, to which it adheres most closely, and which it entirely involves.

“ ‘The seeds are four to eight, elliptical, globular, very slightly (obsoletissimè) compressed, black, terminated by a solid, fungous, white umbilicus, directed towards the superior, or concave, suture of the legumen.

“ ‘The outer covering single, somewhat stony, very hard, carbonaceous within, distinguished by a somewhat prominent groove, immersed in the rima of the cotyledons, and marked within the substance of the groove with a calcareous, snowy nerve, to be traced to the umbilicus.

“ ‘Albumen none, and no trace of it.

“ ‘The embryo conformable to the seed, straight, yellowish. The cotyledons thick, plano-convex, separated throughout the whole circumference of their commissure by a depressed groove, and as it were gaping.

“ ‘No plumula.

“ ‘The radicle globular, retracted, centrifugal.’

“ On this description, I propose to offer one or two observations.

“ Gaertner does not mention the length of the pod. That before us is about 7 inches long, and 3 broad. This legumen is described, by many authors, as being from 4 to 7 inches long, and 2 to 3 inches broad. It appears seldom to exceed these dimensions.

“ Instead of ligneous, it should be described as osseous, if that epithet is applicable to the stone fruits in general, which the substance of this fruit plainly equals in hardness.

“ Gaertner says it is ‘valveless’ (‘avalve’), by which he means that it is indehiscent; and of course he applies this term to all legumens which are indehiscent. If, however, the name legumen be applied to such pericarps, it seems better to allow them to possess valves also, at least when the form of the two portions of the pericarpal wall is so well marked out, as in this case. Gaertner does not hesitate to place this pericarp among legumens; but, contrary to recent usage, he puts the Tonga bean among the drupes. He does not even consider the pericarp of the *Hymenæa* as a drupaceous legumen, but ranks it under the baccate legumens, along with the pericarp of the tamarind, the *Cassia fistula*, and the carob bean, the common character of which is the containing within the legumen a pulp, in which the seeds are imbedded.

“ Gaertner does not take notice of the colour of this pod. It is

variously described by authors, as chocolate-coloured, liver-coloured, and chestnut-coloured; while the roughness of the surface is spoken of as resembling shagreen. There is another species of *Hymenæa* in which the external surface of the pericarp is studded with larger tubercles, whence it is named the *Hymenæa verrucosa*. In Nees von Esenbeck's large work, '*Icones Plantarum Medicinalium*,' the figure of the pod of the *Hymenæa Courbaril* exhibits veins on the surface. In our specimen, there is no appearance of anything of the kind. If such an appearance occur, it must be in the young pod.

"Gaertner says the seeds are from four to eight. It is a singular circumstance, that many of the earlier authors state that the number of the seeds is three. At first, I imagined that this idea had arisen from the figure of a large, broad pod, with three seeds, in Plumier's '*Description des Plantes de l'Amérique*,' being mistaken for his figure of the pod of the *Hymenæa*, which occurs in a different work, his '*Nova Plantarum Americanarum Genera*;' but I find that both Piso and Ray, whose works were published long before either of Plumier's, insist on three seeds, or three stones. In the pod before us, there are four prominent marks of seeds, and several other less prominent elevations, which seem to be the marks of seeds also. If there be really a tendency to no more than three seeds in so large a seed-vessel, it will prove additional evidence of the disposition to a transition from the legumen to the drupe, which this legumen so much resembles in its hardness.

"The seeds are truly called little bones. The black exterior, however, readily scales off in water, and the interior softens. If a specimen of the resina animes fall within the plan of the Museum, I will be glad to present one. Meantime, specimens may be seen in the Museum of the College of Physicians; viz., Nos. 1203, 1204, and 1205."

Rarer Plants of the Neighbourhood of Ripon.

A paper by Mr. James B. Davies, '*On the Rarer Plants found in the Neighbourhood of Ripon*,' was read.

After giving a general account of the geological features of the district, illustrated by a map, Mr. Davies noticed the plants of interest. These were, *Scolopendrium vulgare*, *Bryonia dioica*, *Tamus communis*, *Colchicum autumnale*, *Littorella lacustris*, *Pilularia globulifera*, *Radiola Millegrana*, *Listera cordata*, *Lathræa squamaria*, *Convallaria multiflora*, *Paris quadrifolia*, *Melica nutans*, *Gagea lutea*, *Chlora perfoliata*, *Gentiana Amarella*, *Anchusa sempervirens*, *Ribes alpinum*,

Aconitum Napellus, Atropa Belladonna, Chelidonium majus, Corydalis lutea, Impatiens Noli-me-tangere, Thalictrum majus, Primula farinosa, Carduus Marianus, Hottonia palustris, and many other plants.

Melampyrum montanum, Johnst.

A paper by Daniel Oliver, jun., Esq., F.L.S., 'On *Melampyrum montanum*, *Johnst.*,' was read.

"This plant, as described in the 'Berwickshire Flora,' and mentioned in Babington's 'Manual' as a variety of *M. pratense*, I am inclined to believe, has been founded by Dr. Johnston on an examination of an insufficient series of examples of more or less distinct forms of *Melampyrum*.

"If I mistake not, the only station mentioned in the 'Berwickshire Flora' for this plant, there described as a new species, is by Cheviot; and I dare say the description may be quite comprehensive enough to include each one of the series which may there occur; but, I apprehend, the characters, 'smaller in all its parts,' and 'floral leaves quite entire,' are not essential distinctions of the plant, the smaller forms only of which, I would suggest, have been familiar to Dr. Johnston.

"Last year, I described (*Phytol.* iv. 678) a plant which I called *M. pratense*, var. *ericetorum*; and, in the same communication, hinted that its smaller forms might be identical with the Cheviot *M. montanum*.

"I am rather strengthened in this opinion by a series of specimens which I collected, last month, near the Wall-town Crags, Northumberland. An example or two, selected from these, accompany this notice. It will be observed that the floral leaves (bracts) are, in some of the larger instances of the plant, ovate-lanceolate, or almost ovate at the base, and deeply toothed; while the smaller ones accord more nearly with Dr. Johnston's *M. montanum*. Some of these appear to be similar to luxuriant specimens from Urrisbeg, in county Galway, Ireland, where they attain the most considerable size that I have observed. Irish specimens I also send herewith. I may add, that whatever name be applied to this plant, I cannot but think that some comprehensive characters, which would yet sufficiently distinguish it from *M. pratense*, at least as a marked variety, ought to be substituted for the book-characters of *M. montanum*."

Mr. M'Nab exhibited, from the Royal Botanic Garden, a number of plants, which had been recently presented to the Garden.

The following gentlemen were balloted for, and duly elected Ordinary Fellows :—Resident: Andrew Taylor, Esq., 31, Buccleuch Place, Edinburgh. Non-resident: Dr. Grierson, Thornhill, Dumfries-shire; and T. Southwell, Esq., Holt Road, Falkenham, Norfolk.

M. Auguste Le Folis, Cherbourg, was elected a Foreign Member.

Mr. Alexander Osmond Black, Burton Street, London, was elected an Associate.

The Society then adjourned till the second Thursday of November.

NOTICES OF NEW BOOKS, &c.

‘The Gardeners’ Chronicle,’ Edited by Professor Lindley, No. 36, September 3, 1853.

Our attention has been invited to a paper in the ‘Gardeners’ Chronicle,’ in which, as it seems to the talented and venerable friend who hands us the newspaper, as well as to ourselves, there is a great confusion of terms and ideas, and hence, also, abundant germs of absolute error. To suppose that Professor Lindley would pen such an article, would be to erect a theory opposed to intrinsic evidence; but the article goes forth to the world anonymously, the Professor himself being the avowed and advertised editor; and, therefore, it is perfectly in accordance with usage to hold him responsible for the opinions expressed. We cite the article entire.

“The species of plants, like those of animals, appear to be eternal, so far as anything mundane can deserve that name. There is not the smallest reason to suppose that the olive of our days is different from that of Noah; the *Asa dulcis* stamped upon the coins of Cyrene still flourishes around the site of that ancient city; and the acorns figured among the sculptures of Nimroud seem to show that the same oak now grows on the mountains of Kurdistan as was known there in the days of Sardanapalus. There is not the slightest evidence to show that any species of plant has become extinct during the present order of things. All species have continued to propagate themselves by seeds, without losing their specific peculiarities; some appointed law has rendered them and their several natures eternal.

“It would seem moreover that, with the exception of annuals and others of limited existence, the lives of the individual plants born from

such seed would be eternal also, if it were not for the many accidents to which they are exposed, and which eventually destroy them. Trees and other plants of a perennial nature are renovated annually ; annually receding from the point which was originally formed, and which in the nature of things must perish in time. The condition of their existence is a perpetual renewal of youth. In the proper sense of the word decrepitude cannot overtake them. The Iris creeps along the mud, ever receding from the starting point, renews itself as it advances, and leaves its original stem to die as its new shoots gain vigour ; in the course of centuries a single Iris might creep around the world itself, if it could only find mud in which to root. The oak annually forms new living matter over that which was previously formed, the seat of life incessantly retreating from the seat of death. When such a tree decays no injury is felt, because the centre which perishes is made good at the circumference, over which new life is perennially distributed. In the absence of accidents such a tree might have lived from the creation to this hour ; travellers have even believed that they had found in the forests of Brazil living trees that must have been born in the days of Homer. But here again inevitable accidents interfere, and the trees are prevented from being immortal.

“Species, then, are eternal ; and so would be the individuals sprung from their seeds, if it were not for accidental circumstances.

“But plants are multiplied otherwise than by seeds. The hyacinth and the garlic propagate naturally, not only by seeds, but also by the perpetual separation of their own limbs, known under the name of bulbs, their bulbs undergoing a similar natural process of dismemberment ; and so on for ever. The potato plant belongs to the same class. Another plant bends its branches to the ground ; the branches put forth roots, and as soon as these roots are established the connexion between parent and offspring is broken, and a new plant springs into independent existence. Of this we find familiar examples in the strawberry and the willow. Man turns this property to account by artificial processes of multiplication ; one tree he propagates by layers, another by cuttings planted in the ground. Going a step further he inserts a cutting of one individual upon the stem of some other individual of the same species, under the name of a bud or a scion, and thus obtains a vegetable twin.

“It is not contended, for there is nothing to show, that these artificial productions are more short-lived than either parent, provided the constitution of the two individuals is in perfect accordance. There is not the smallest evidence—it has not been even conjectured—that

if a seedling apple-tree is cut into two parts, and these parts are reunited by grafting, the duration of the tree will be shorter than it would have been in the absence of the operation.

“It is nevertheless believed by many that the races of some cultivated plants have but a brief duration, provided they are multiplied otherwise than by seeds. No one indeed pretends that the garlic of Ascalon has only a short life, although it has been thus propagated from the time when it bore the name of Shummin, and fed the labourers at the Pyramids; nor do we know that the bulb-bearing lily has been supposed to have less inherent vigour than if it were multiplied by seeds instead of bulbs. It is only among certain kinds of plants that exceptions to the great natural law of vegetation are supposed to exist. It is thought that although the wild potato possesses indefinite vitality, yet that the varieties of it which are brought into cultivation pass their lives circumscribed within very narrow limits; and the same doctrine has been held concerning fruit-trees. The great advocate of this view, the late Mr. Andrew Knight, rested his case upon the disappearance of certain kinds of apples and pears, once to be found in the orchards of Herefordshire, but now no longer to be met with. This he ascribed to cultivated varieties being naturally short-lived, and to an impossibility of arresting their gradual decay by any process of dismemberment; and following out this theory he strongly urged the necessity of renewing vitality by continually raising fresh varieties from seed. It is difficult to comprehend what train of reasoning led to this speculation. We know that wild plants may be propagated by dismemberment for an indefinite period; we know that when such wild plants spring up from seed the dismembering process still goes on and still without exhibiting symptoms of exhausted vitality; and yet if a plant grows in a garden, and is brought under the direct control of man, the power is thought to be lost, or so much impaired that indefinite multiplication no longer becomes possible. Can this be true? Most assuredly the cases adduced in support of the doctrine are susceptible of another explanation, perfectly consistent with the general laws of vegetation.

“That renewal by seed will not restore what is called exhausted vitality, was sufficiently proved by the experiments with potatoes after the blight made its appearance. We were assured by an ingenious writer in one of the daily papers that the constitutional power of the potato was on the decline; in other words, that the lives of individuals was approaching their end; that the blight arose in consequence, and that a certain remedy would be the renewal of the exist-

ing races by sowing seeds. Hundreds joined eagerly in what proved to be the vain pursuit. A worthy armourer at Solingen even published an elaborate pamphlet in support of the idea. *Nein mehr Hungersnoth*—no more famine—was his audacious motto—a prediction wofully falsified by the result, for the seedling potatoes were, if possible, more diseased than their parents.

“So many persons, however, disregarding what we presume to think the preponderating weight of evidence to the contrary, still continue to look upon the question as one open to further discussion, that a learned German Scientific Society has determined to make it the subject of further and more elaborate examination.

“A committee appointed under the Demidoff foundation in Berlin, has just announced that a prize of £30 (200 thalers) is offered for the best essay upon the duration of life in plants propagated otherwise than by seed. The question to which competitors must address themselves may be thus freely translated:—‘Is the life of an individual plant, in its widest sense, that is to say, of a plant itself raised from seed and then propagated otherwise than by seed (by cuttings, layers, buds, grafts, &c.), unlimited in duration, and destructible only by accidental or external unfavourable circumstances, before the extinction of the species itself? or is the life of such individual limited, and to a certain definite extent shorter than the duration of the species?’

“Competitors are expected to give, in addition to any unpublished cases, the fullest possible collection and examination of published facts relating to the degeneracy or total extinction of seedlings, preserved and propagated otherwise than by seed, and more particularly of seedling fruits cultivated in Europe, *viz.*, apples, pears, quinces, medlars, plums, cherries, apricots, peaches, almonds, figs, mulberries, the different kinds of orange, olives, walnuts, filberts, grapes, gooseberries, currants, raspberries, and strawberries; and the sources from which the facts are taken must be stated. Attention must also be paid to the circumstances under which the degeneration of the plants reported on occurred; the climate and soil in which they grew, the treatment and care they received, so far as these can affect the answer to be given to the question, and any evidence relating to them which can be found.

“It is announced that the essays for the prize may be written in English, French, German, Italian, or Latin, and must be delivered before the 1st of March, 1854, to Dr. Nees von Esenbeck, President of the Academy of Naturalists at Breslau. Each essay must have a motto prefixed, and in an accompanying envelope the name of the

writer must be given. The result of the award is to be made known in the 'Bonplandia' newspaper of the 17th June, 1854, and the successful essay will be printed in the Transactions of the Academy Naturæ Curiosorum. Full particulars will be found in the 'Allgemeine Gartenzeitung' for the 30th July, of the present year.

"Since it is obvious that no special experiments can now be instituted for the purpose of testing this theory, the attention of the essayists will necessarily be confined to a diligent accumulation of evidence, and to the conclusions which it renders necessary. We dare say the proposal will find respondents among men of leisure who have access to large libraries, and we venture to hope that they will be able to settle so vexed a subject. We trust they will take care not to confound the duration of natural seedlings with that of vegetable mules, which is a wholly different question."

In this paper, it appears to us that the terms "kinds," "species," "races," "varieties," and "individuals" are employed both without any just appreciation of the meanings which they are usually intended to convey, and without any attempt to distinguish between the natural conditions of either. A "race," like the term "alliance," or "family," or "natural order," or "genus," implies to the ear of every botanist a plurality of "species:" a "species" implies a plurality of "individuals" which agree in reproducing their own likeness, again and again, through a succession of generations: a "kind" is a vague and unbotanical term; the only definite meaning that can be attached to it is, "a peculiar individual, raised from the seed of a species," as a golden pippin might be called a good "kind" of apple: a "variety" is the deviation of *many* individuals, undoubtedly the descendants of one species, from the normal type of colour or form; thus, the white individuals of *Geranium Robertianum* constitute a variety as regards colour, and the *Peloria* individuals of *Linaria vulgaris* constitute a variety as regards form. We do not attempt to give this as a novel or scientific definition of the terms, but as a definition which exhibits sufficiently well the absence of concord between the terms, and exhibits, also, as injudicious, the practice of using them indifferently. From the paper before us the terms "kinds," "races," and "varieties" should be erased, as irrelevant, and the question discussed simply in reference to the more definite ideas, "species" and "individuals."

Now, a line being drawn between "species" and "individuals," we cannot accept the author's mode of reasoning from one to the other. "Species are eternal," he says; and he goes on to argue,

that therefore Andrew Knight was wrong in stating that individuals were perishable. Now, with regard to the first position, that "species are eternal," we take the liberty of stating that this assertion requires modification. We are well aware how great and how just is the reputation of him from whom the assertion has been borrowed. Linneus, in his '*Philosophia Botanica*,' says:—

"Species tot numeramus, quot diversæ formæ in principio sunt creatæ.

"Species tot sunt, quot diversas formas ab initio produxit Infinitum Ens; quæ formæ, secundum generationis inditas leges, produxere plures, at sibi semper similes. Ergo species tot sunt, quot diversæ formæ s. structuræ hodiernum occurrunt.

"Oratio de *Telluris habitabilis incremento*, Ups. et Leyd. edita, consequentias plurimas super hoc argumentum edocuit." *

And, again, with reference to the "Iris creeping round the world," he continues:—

"Radix extenditur in herbam inque infinitum, usque dum apice rumpantur integumenta in florem, formantque semen contiguum, ultimum terminum vegetationis; Hoc semen cadit, prognascitur, et in diverso loco quasi plantam continuat; hinc simillimam sobolem producit, uti Arbor ramum, Ramus gemmam, Gemma herbam; ergo Continuatio est Generatio plantarum."

Linneus appears to have been taken as an absolute authority, and his idea of the species now extant having existed from the beginning to have been adopted without the slightest modification. But the question must arise, in the mind of every one capable of a moment's reflection, Is this assertion true? We think not. Geologists have shown that the earth has undergone no changes but those which are still in progress; and yet we believe the *Megatherium*, the *Mylo-don*, the *Pterodactylus*, did once exist, and do not now exist. We believe, also, that all the plants of the coal-strata did once exist, and do not now exist. We believe, also, that thousands of species exist now which did not exist with the plants of the coal-strata; and we ground this opinion on the fact, that no traces of such recent species exist in the strata to which we refer; and those strata are imperishable records of what did once exist; and we find no evidence to show that any extraordinary convulsion caused their destruction; indeed, we know their destruction was neither sudden

* A translation of this 'Oratio' will be found in Sir J. E. Smith's '*Tracts on Natural History*.'

nor simultaneous, but that it was spread over thousands of years. Our author will probably at this point invoke the waters of the deluge, in order to drown this view of the case; but if there be one feature in the biblical history of that event more prominent than the rest, it is the especial care taken by the Almighty that not a "species" should perish; so that naturalists are, as it were, cautioned, on the very threshold of the inquiry, against the introduction of the Bible in support of their speculations. Now, it must be patent to the most ordinary capacity, either that the Megatherium, Pterodactylus, and the entire coal series of vegetables actually exist at the present moment, or that the Linnean hypothesis of the eternal duration of species is altogether futile.

We now arrive at the second division of the Editor's leader, that which appears penned in express opposition to the views of Mr. Knight; and here we think the writer equally in error.

There are certain plants, such, for instance, as the plum, the pear, the apple, the bramble, the rose, &c., which accompany man in his migrations, and adopt his home for their own. Most of these have obtained his peculiar regard from the value of their fruit, and all are subject to that deviation from typical and original character, which results from domestication. In reproducing these plants from seed, it is notorious that the descendant is not the exact image of the parent. For instance, the stone of a greengage, the pip of a jargonel or Ribstone pippin, the seed of a *Rubus Grabowskii* or a *Rosa Devoniensis*, do not necessarily reproduce their kind: such a fact *might* result, but there is no law by which it *must* result; and those who have studied the matter, and practically tested it, well know that such a fact would be opposed to the ordinary result. There is every human probability that six mature seeds of either of these plants would produce plants not merely unlike the parent, but unlike each other. The Bombi, or humble bees, are the great agents in the creation of species of brambles; in this work leaving our valued *collaborateurs*, Lees, Babington, and Bell-Salter, far, far behind: and to the same instrumentality we are probably indebted for some of our choicest apples. How, then, is the likeness of the parent to be perpetuated? We answer, by taking an integral portion of that parent, *viz.*, a cutting or bud, growing it either in the ground, or grafting it on another stock. By such a process, greengages and jargonels are indefinitely multiplied, until a seedling plant may have thousands of detached members, in all respects the image of itself.

An individual being thus indefinitely multiplied, and the existence of each portion of the individual thus commencing, as it were, *de novo*, it seems not unlikely that we should forget the bond of unity existing between the disjointed members, or that we should consider each member in the light of an independent being. This idea, however, is not logical. It needs but a moment's reflection to be assured that the individual is merely dismembered; and that if perchance it has produced offspring, those offspring belong altogether to another category, each having an individuality of its own. Thus, for example, the offspring of a nonpareil would perchance resemble a golden pippin, a golden knob, a Ribstone pippin, a Downton pippin, or some other pippin. It certainly would not be either of these, because such pippins, like the nonpareil, are simply individuals; and it as certainly would not be a nonpareil, because the term "nonpareil" attaches to an individual only, and its disjointed members. We thus arrive at the conclusion that those apples, which Mr. Knight said were dying out, or would die out, were individuals only, and have nothing whatever in common with species, not being capable of reproducing their kind. To this we have only to add, that the experience of every gray-headed horticulturist with whom we have conversed, whether in Sussex, Devonshire, or Herefordshire, confirms and corroborates Mr. Knight's statement, and leads us to regard him as the most philosophical, as well as the soundest practical, horticulturist that the world has produced; and we hold his recommendation to continue the multiplication of individuals from seed, with a view to securing a succession of useful plants and beautiful flowers, to be the very keystone of modern horticulture, and, more than that, the main source of that revenue which is accruing from the publication of such works as the 'Gardeners' Chronicle.'

The following passage, also, is as erroneous botanically as those we have already cited are fallacious in a geological or horticultural point of view:—"Another plant bends its branches to the ground; the branches put forth roots, and as soon as these roots are established the connexion between parent and offspring is broken, and a new plant springs into independent existence." Now, the banyan-tree is the most familiar instance of this peculiarity, yet serves but as the type of a thousand others in which these supplementary roots, put forth by the branches, serve to support the parent, and prolong an existence with which their own is absolutely identified. It is true that the 'Gardeners' Chronicle' does not claim to be regarded as an oracle on scientific questions; but some care should be taken that

no statement in the editorial articles be at variance with scientific truth.

‘*Terra Lindisfarnensis. The Natural History of the Eastern Borders.* By GEORGE JOHNSTON, M.D. Edin.; LL.D. of Marischal College, Aberdeen; Fellow of the Royal College of Surgeons of Edinburgh; &c. Vol. I. The Botany. London: Van Voorst. 1853. Price 10s. 6d.’

This is a book which we take up with the most entire good will, and which we have read with pleasure and instruction; yet there are a few particulars which, as conscientious critics, we must mention with disapprobation:—1st. The title may be intelligible, nay, even expressive, to a resident at Berwick-upon-Tweed; but in these southern regions its meaning is near akin to a riddle. We will, therefore, state, for the benefit of the uninitiated, that “the Eastern borders comprehend the whole of Berwickshire, the liberties of Berwick, North Durham, and the immediately adjacent parts of Northumberland and Durham.” 2ndly. We do not admire the illustrations, although we learn that some of them are from a lady’s pencil. The pictorial ones are out of perspective, and the botanical ones are unbotanical. The blossoms of the *Hieracia*, Plates II., III., and IV., convey no idea even of the genus. The *repetition* of the woodcuts is also contrary to custom. 3rdly. We do not like the phraseology. It is, perhaps, provincial; but then, Dr. Johnston writes for the kingdom at large, and not exclusively for the inhabitants of the Eastern Borders; and, supposing it were so,—supposing he addressed himself solely to his neighbours,—it were but a poor compliment to those neighbours to address them in bad or awkward English. In one paragraph, the following phrases, or sentences, occur:—“Too *tenuous* for manhood;” “*minded* head;” “*incapableness*;” “hinder the worthiest *to* examine;” “Therefore, reader, do not go away repelled by the seeming littleness of what *you* may herein read, make the subject of *thyself* greater and worthier, for I would fain solicit *thee* to a pupilage that may teach *you*;” &c., &c. The paragraph in which these expressions occur is full of noble sentiments, indeed it is the best in the book, and well deserves a little more trouble than has been bestowed upon it. We have compressed the criticisms into the fewest possible words, being desirous of hastening on to the more agreeable task of praising; and we assure our readers that we may

bestow praise without stint, and without qualification, on this really interesting volume.

The design of that portion of the work now published, is to give a complete list of the plants of the district indicated. These are distinguished as the *indigenous*, the *naturalized*, and the *cultivated*, each distinction being indicated by a different type, and a different set of numerals. Besides these three main divisions, there are a few stragglers and extirpated species, given in foot-notes. These distinctions are always, in some measure, arbitrary: few of us can totally banish feelings of favouritism or distrust, when engaged in this task of assigning its exact rank to each species as it comes before us. The following is a summary of the Eastern-Borders phanerogamic Flora:—

	Indigenous.	Naturalized.	Cultivated.	Stragglers.	
Endogens....	532	37	30	41	= 640
Exogens	168	4	8	9	= 189
	—	—	—	—	—
	700	41	38	50	= 829

The name of each species is accompanied by some observation; sometimes a mere local appellation, or a habitat, but for the most part a more extended note, embracing diversified and agreeable information, both borrowed and original. We select examples.

“*Papaver Rhœas*. William Turner writes in 1551:—‘This kind is called in English corn-rose or red corn-rose, and with us it groweth much amongst the corn and barley.’ It has been very sensibly reduced both in quantity, and its distribution, within the present century; but, in some farms, as in Holy-Island, the poppy still abounds to excess, and imparts a gay hilarity to the sombre cornfields. It disappears from infested fields when these are laid down in grass, and endures nowhere long if the soil is undisturbed; but let the ground be disturbed anew by the plough or the spade, no matter at what distant interval, the weed reappears in rich profusion. Of this fact we had an illustration when the railway was made from Berwick to Cockburnspath, and from Tweedmouth to Kelso. The sides of the cut were, in many places, literally clothed in scarlet; and this was especially the case where the line had been cut through those gravel knolls which some conjecture were deposited towards the termination of what has been called the glacial epoch. Nor need we be hindered from entertaining the belief that the poppy was amongst the first plants that occupied the naked surface of those knolls, burying therein

the seeds of primeval crops to be preserved intact until accident shall bring them up and within the influence of vivifying agents. There is a far-distant antiquity even in one of its provincial names. In the neighbourhood of Gordon I heard this weed called *Cockeno*,—evidently from ‘coch,’ the Celtic for scarlet, and hence the name is probably coeval with the early inhabitation of the district. In other parts of Derbyshire the plant is called Cock’s-combs. About Wooler it was wont to be called the Thunder-flower, or Lightnings; and children were afraid to pluck the flower, for if, perchance, the petals fell off in the act, the gatherer became more liable to be struck with lightning; nor was the risk small, for the deciduousness of the petals is almost proverbial. ‘And it is called *Papaver erraticum* in Latin, in Greek, *Rhœas*, because the flour falleth away hastily.’ Turner.—When cultivated, it becomes a beautiful annual. ‘In hortis, ubi florum colore pulcherrime ludit, nempe miniato, sanguineo, purpureo, carneo, niveo toto, carneo per limbum albo, &c.’ Haller, *Flor. Jenen.* p. 70.” —P. 30.

The following extract is only a portion of the observations under *Cardamine pratensis*. It is copied because we consider it botanically valuable.

“*Cardamine pratensis*. In autumn little bunches of leaves may be seen often to grow from the upper surface of the old but perfectly fresh leaves, each bunch throwing out a radical fibre that creeps along in search of a soil proper to take root in. These parasitical bunches are young plants, and will detach themselves either when the root-fibre has reached the soft ground, or when the parent leaf has decayed.” —P. 33.

The following learned remarks on the metamorphosis of cereals will not be read without a smile at the hypothesis of the vestigians.

“*Agrostemma Githago* = *Lychnis Githago* = *Githago segetum*, Don, *Gard. Dict.* i. 417.—Corn Cockle: Popple or Pawple.—Corn-fields, a showy but noxious weed; and hence its name is often used figuratively in composition. ‘Some have made virginity the corn, and marriage the cockle.’ Fuller, *Ch. Hist.* i. p. 294.

‘ Good seed degenerates, and oft obeys
The soil’s disease, and into cockle strays.’

Donne.

Donne, in this couplet, asserts a metamorphosis, the reality of which our early herbalists never doubted. Wheat, they believed, sown in scur land became rye in the second year, and two years after went

into darnel. Barley under a similar treatment passed into oats; and cereals in general might become the very weeds that choked the husbandman's expectations. Of the Blewbottle or Bleublaws, Turner says:—'It groweth much among Rye: wherefore I thynke, that good ry, in an euell and unseasonable yere doth go out of kynde in to thys wede.'—In relation to this subject the curious reader may consult Dr. Weissenborn's account of the transformation of oats into rye in Charlesworth's 'Magazine of Natural History,' i. p. 574; ii. p. 670: 'Vestiges of Creation,' p. 225, and the Sequel, p. 111: 'Notes and Queries,' vi. p. 7.—Cockle, says Richardson, is from the 'A. S. coccel, which Skinner thinks is from Ceocan, to choke, because it chokes the corn.' This is to mistake the character of this weed: it does not choke the corn, but its injuriousness arises from the seeds being mingled and ground with the grain and communicating an unwholesome quality to the flour. The name undoubtedly has the same root as Cockeno (p. 30). Indeed Bailey makes Cockle the synonym of the Corn-Rose; and Johnson defines it to be 'a species of poppy. The seeds are reckoned a remedy for toothache.'—P. 41.

(To be continued).

A few Notes on the Botany of Jersey; including a List of Additions to Mr. Babington's 'Primitiæ Floræ Sarnicæ,' by M. Piquet.
By N. B. WARD, Esq., F.R.S., &c.

I HAVE just returned from a tour of two or three weeks to Jersey; and having been favoured with a note of introduction to one of the resident botanists, M. Piquet, of St. Helier's, was kindly taken by him to (with me) the great object of attraction,—the *Gymnogramma leptophylla*. I saw it growing, as stated in the 'Phytologist,' on a bank with a south-western aspect, not densely shaded by trees, as is the case in most of the Jersey lanes, but protected from the direct rays of the sun, by the dwarf vegetation of the bank, which, from the constant oozing of a small stream, is sufficiently damp for the growth of *Marchantia*, with here and there a patch of *Fissidens bryoides*. I was shown two stations of this interesting plant by M. Piquet, and a third, about a mile from the former, by the Rev. W. Wait. It doubtless will be found in other localities, as the climate must nearly approach that of the South of France, and of Italy, where the *Gymnogramma* abounds. The next plant to which I directed my

attention was *Asplenium lanceolatum*, as I had found more trouble in growing this plant, either in or out of a case, than with most other ferns, either British or foreign. This plant is far more abundant in the western than in the eastern part of the Island; and, somewhat to my surprise, I found it flourishing under very different conditions of light and moisture. Near Grosnez, it is found growing in the crevices of the stone walls, fully exposed to the blaze of the sun, scarcely attaining, however, the height of more than one or two inches, and with very crisp and curled fronds. It attains its greatest development on the top of densely shaded sandstone banks at St. Aubin's, where its fronds are a foot in height, and the soil very dry; and likewise in the inside of wells, one or two of which were completely lined with it, where it must have been growing undisturbed for years, from the great number of fronds springing from a single root. One specimen that I gathered, in the inside of a well between Roselle and Boulay Bay, had 120 more or less perfect fronds upon it, besides portions of the footstalks of sixty or seventy others. These fronds were twelve or thirteen inches in height. In all cases the plants are surrounded by a mild and humid atmosphere, free from soot or dust; and both the *Asplenium* and *Gymnogramma* would succeed best with us with a little protection. This will not be a matter of surprise, when the mildness of the climate of Jersey is taken into account, where the giant cabbage grows to the height of twelve or thirteen feet, the mellow pears attain a weight of two or three pounds, and the *Hydrangea* is loaded with many hundred heads of flowers.*

The phænogamous vegetation of Jersey is rather disappointing to one who, like myself, has been accustomed to botanize on the chalk-hills in Kent, from the total absence of many of our most interesting ornamental plants. No *Campanula* is to be seen, and very few of the *Orchideæ*, &c. But upon this part of the subject I need not dilate, as M. Piquet has most kindly favoured me with the result of his long-continued and patient observations, in a list, for which, I am sure, your readers will be much indebted to him. The mosses were mostly dried up; but I was much struck with the pictorial effect of the *Didymodon purpureum* on the slope of a sunny hill, where the furze had been cut and burnt.† When I first saw the plant, I thought it was *Funaria hygrometrica*, which is frequently found under similar

* Mr. S. Curtis, of Roselle, mentioned to me one specimen in which he had counted 2700.

† Nearly two acres were covered with this moss, with a few patches intermixed of *Sedum anglicum*, whose leaves rivalled the capsules of the moss in colour.

conditions, as in open places in woods where charcoal has been burnt.

I would direct the attention of the botanist to the marine Algæ, which would, I am convinced, yield an abundant harvest. Limited as my researches were to a small portion of the coast, *viz.*, between St. Aubin's and Portelet Bays, a space of three or four miles in extent, I yet collected more than sixty species, and amongst them *Griffithsia barbata*. The study of these plants is most interesting, as many species are to be found in every possible state of development, according as they occur near high- or low-water mark, or on different aspects of the rocks on which they are growing, &c. Thus, the *Cladostephus spongiosus*, which, in the upper pools, appears to grow solely to afford attachment to species of *Conferva*, *Cladophora* and *Ceramium*, in the pools near low-water mark, attains twice the size, and is unincumbered with parasites. But the submarine vegetation is worthy of all admiration. Nothing can exceed the beauty of the groves of *Halidrys siliquosa*, here ten or twelve feet in height; the *Chorda Filum*, attaining a much greater length, with the upper portions of its stems floating, in the most graceful curves, upon the surface; and the densely packed and lively green leaves of *Zostera marina*; all affording food and support to thousands of small animals, and all pleasing in their turn.

But I must close my imperfect sketch, well satisfied if others be tempted to carry out these investigations to a greater extent than I was enabled to do.

I cannot omit recording my obligations to Dr. Robert Ball, of Dublin, who kindly furnished me with one of his naturalists' dredges,* which, when compared with the ordinary oyster-dredge, does three times the work with half the labour. I have likewise to thank Miss Turner, of Gorey, for specimens of *Griffithsia barbata*, *Daysa venusta*, and many other Algæ.

I conclude with M. Piquet's List of Plants found in Jersey, but not mentioned by Mr. Babington as natives of that Island, although a few of them are recorded by that botanist as occurring in the other Channel Islands.

Those species supposed by M. Piquet to have been either naturalized, or in any respect doubtful natives, are marked by a star (*); and those which occur in the other Channel Islands, as well as in Jersey, by a dagger (†). The list includes sixty-six flowering plants, and one fern.

* Described by Harvey, in the 'Sea-side Book.'

- **Clematis Vitalba*, L. Growing on a hedge in St. Aubin's Bay.
Barbarea præcox, Br. Frequent in waste places.
Camelina sativa, Crantz. St. Saviour's Valley.
†*Sinapis tenuifolia*, Br. St. Ouen's Bay, and the Quenvais.
†*Crambe maritima*, L. St. Ouen's Bay, on the shingle.
Silene inflata, Sm. St. Clement's and St. Ouen's Bays ; rare.
†*Silene quinquevulnera*, L. St. Aubin's Bay ; very scarce.
**Silene Armeria*, L. In a lane near La Haule.
Saponaria officinalis, L. St. Saviour's ; rare.
Elatine hexandra, DC. Town Mill-ponds.
Althæa officinalis, L. St. Clement's Bay ; scarce.
**Geranium striatum*. St. Martin's, in hedges.
Melilotus officinalis, Lam. St. Aubin's Bay.
Lathyrus Aphaca, L. St. Peter's, and at Trinity ; rare.
**Lathyrus latifolius*, L. St. Helier's.
†*Prunus Cerasus*, L. In woods ; frequent.
**Potentilla hirta*, L. On a wall near Millbrook.
Agrimonia Eupatoria, L. Frequent on the coast.
**Oenothera biennis*, L. Greve d'Azette.
Myriophyllum spicatum, L. St. Ouen's Pond.
†*Chrysosplenium oppositifolium*, L. St. Saviour's Valley, &c.
†*Enanthe pimpinelloides*, L. Near St. Ouen's Pond.
†*Galium saxatile*, L. Bouley Bay, Noirmont, &c.
Bidens cernua, L. St. Laurence Marsh.
†*Pyrethrum inodorum*, Sm., var. *β. maritimum*. At. Petit Port.
Centaurea Jacea, L. St. Ouen's Bay.
†*Cichorium Intybus*, L. Gorey Common, &c.
Apargia autumnalis, Willd. A proliferous variety of this plant is found at St. Ouen's Bay, in which the outer florets are very much elongated, and the plant has the appearance of a *Daucus* in seed.
Hypochæris radicata, L. Found in the same state as the preceding, and in the same locality.
**Tragopogon porrifolius*, L. On walls, in various places.
†*Ligustrum vulgare*, L. Growing wild, at the Corbierre.
Lycium europæum, L. In various places, St. Aubin's Bay.
Physalis Alkekengi, L. Fields at Mount Neron.
Orobanche arenaria ? St. Ouen's Bay, on *Eryngium maritimum*.
Linaria Cymbalaria, Mill. St. Clement's Lane.
†*Lycopus europæus*, L. St. Saviour's Valley, &c.
Galeobdolon luteum, Huds. St. Catherine's Bay.

- †*Lamium amplexicaule*, L. St. Brelade and St. Clement's.
Teucrium Chamædrys, L. Lane at Trinity.
 †*Atriplex deltoidea*, Bab. Near St. Helier's.
 †*Atriplex rosea*, L. St. Ouen's Bay.
Polygonum amphibium, L., var. *β. terrestre*. Margin of ponds ; frequent.
 †*Polygonum lapathifolium*, L. St. Clement's Bay.
Polygonum minus, Huds. St. Laurence Marsh.
 †*Polygonum maritimum*, L. St. Aubin's Bay.
Salix viminalis, L. St. Catherine's Bay.
Orchis Morio, L. St. Ouen's and Rozel ; rare.
 †*Listera ovata*, Br. Valley des Vaux ; scarce.
Allium ursinum, L. In woods, St. Brelade.
 **Muscari comosum*, Mill. In a field near the first Martello tower, St. Aubin's Bay.
 †*Juncus glaucus*, Ehrh. St. Ouen's Bay.
 †*Juncus maritimus*, Sm. Near Petit Port, and Pointe des Pas.
 †*Luzula campestris*, Br., var. *β. congesta*. St. Brelade and St. Ouen.
 †*Typha latifolia*, L. St. Peter's Marsh.
Sparganium simplex, Huds. St. Laurence Marsh.
 †*Zannichellia palustris*, L. In brooks, St. Clement's Bay.
Cladium Mariscus, Br. St. Ouen's Bay.
 †*Carex stellulata*, Gooden. Bouley Bay, &c.
Carex binervis, Sm. Bonnenuit, and near Rozel.
Setaria verticillata, Beauv. The Marais, St. Ouen.
Agrostis Spica-venti, L. Bouley Bay ; very rare.
 †*Arundo Epigejos*, L. St. Catherine's Bay.
Bromus secalinus, L. The Quenvais.
Bromus arvensis, L. Meadows near St. Ouen's Pond.
Lolium multiflorum, Lam. Greve d'Azette, and Trinity.
Digitaria sanguinalis, Scop. St. Saviour's ; very scarce.
Gymnogramma leptophylla. At St. Laurence, and near La Haule.

N. B. WARD.

Clapham Rise,
 September 20, 1853.

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Forty-ninth Sitting.—Saturday, September 24, 1853.—MR. NEWMAN, President, in the chair.

The following communications, received during the last few weeks, were read :—

Rosa hibernica in Cumberland.

“ I believe there is no published report of *Rosa hibernica* growing wild in England. I observed a single bush of it in 1845, by the road above Crummock Water, Cumberland, in the way from Buttermere to Scale Hill. I had the pleasure of confirming the discovery in June last, by finding several bushes in a hedge near Lorton, in the same neighbourhood; and Mr. Robinson, of Whinfell Hall, has since found the species in many places in the Vale of Lorton, and towards Scale Hill.”—*W. Borrer; Henfield, September 20, 1853.*

New Station for Teucrium Botrys.

“ *Teucrium Botrys* was shown me about a fortnight since, by its discoverer there, Mr. Arthur Stedman, on Bagley Hill, Bookham, Surrey, about three miles, ‘as the crow flies,’ from the place where it was originally discovered, between Betchworth and Headley. Mr. Stedman has observed it in three spots, some growing on cultivated land, but most of it among thin grass on bushy hill-sides. Surely the discovery of this additional station tends to remove all doubt of the species being truly indigenous. I wish some one would seek for it about Saunderstead, as Mr. Anderson, late Curator of Chelsea Garden, showed me, many years ago, some plants in the Garden said to have been brought from that neighbourhood.”—*Id.*

Carex punctata in Ireland.

“ It may interest some readers of the ‘Phytologist’ to know that *Carex punctata*, *Gaudin*, grows in Co. Kerry, Ireland. It is one of the most interesting of the many interesting plants which I brought home, last month, from the Dingle peninsula. It occurred near the mouth of the harbour, about a mile or so from Dingle, near a tower

occupied by the revenue-service, I believe. From what has been written and said respecting this *Carex* and its allies, it is, doubtless, known that unusual caution is requisite when it is under consideration. I may say, however, that, in the present case, I feel perhaps no doubt but that this is the *C. punctata* of those English botanists who know the Guernsey plant, and of Scandinavian collections, as I judge from a Norwegian example, which I possess, from Southern Norway, from Prof. Blytt, and the figure in Andersen's *Plantæ Scand.*, which, so far as I have seen, agree well enough. Wm. Borrer and C. C. Babington confirm my name. I was not aware that any doubt attached to the Menai-Straits station, mentioned in our Manuals; but, from what W. Borrer tells me, in a letter, I find it must be received with a degree of dubiety (this may, however, apply to but *one* locality by the Straits, if there be *two*). The station near Dingle is, so far as I know, the only satisfactory locality for the plant in Ireland, if not in the British Islands, exclusive of the Sarnian group. (See H. C. Watson's remark, in 'Cybele,' on the Cornish habitat). It seems, I may add, to differ at *first sight* from the nearly allied *Carex distans*, and may, perhaps, admit of a clear and specific distinction, in the *longer exerted* peduncles of the *cylindrical* fertile spikes of *patent, pale* fruit."—*D. Oliver, jun.*; *Newcastle-on-Tyne, September 23, 1853.*

Agrimonia odorata in Kerry.

"Another interesting plant, which I gathered in Kerry, new to the South of Ireland, is what I consider to be *Agrimonia odorata*, *Ait.* I collected but two examples, I think, stopping the conveyance for the purpose, by the roadside to the north of Dingle Bay. C. C. Babington, to whom I sent a small specimen, and W. W. Newbould, confirm my opinion, without speaking positively; the example not being, I think, in fruit, when its more apparent distinction presents itself."—*Id.*

Notes on a few Devonshire Plants.

"Perhaps it may be worth while to mention a few Devonshire plants which I gathered in June, during a visit to Harpford, a country village, situated about three miles and a half from Sidmouth, and the same from Ottery St. Mary. They have all been enumerated in the 'New Botanist's Guide,' in the list for Devon; but, with the exception of *Ruscus aculeatus* and *Lathyrus Aphaca*, the localities, so far as I am aware, have not been reported before for that part of

Devon. *Corydalis lutea*: under a wall, in one or two places, at Harpford; doubtless a garden escape. *Barbarea præcox*? a solitary specimen, gathered on the roadside, by a rivulet, between Harpford and Sidmouth. *Coronopus didyma*: very abundant in the adjoining village of Newton Poppleford, outside the garden walls. It was quite rare at Harpford, though occasionally seen. *Lepidium Smithii*: on a sandstone rock near Harpford. I only found one specimen; but, as the rock crumbled down, I think it probable that other plants lay concealed underneath. *Hypericum Androsæmum*: not unfrequent in Harpford Wood, and other places. *Arenaria marina*: on the sea-coast at Sidmouth. *Ulex nanus*: on the Beacon and Peak Hills, both the highest ground in that neighbourhood. The plants did not reach to the summit, and were sheltered by the banks from the sea breezes. *Lathyrus Aphaca* still retains its habitat on Sidmouth cliffs, growing, in great luxuriance, amongst *Lotus corniculatus* and *Anthyllis Vulneraria*. *Cotyledon Umbilicus*: in every hedgebank and lane at Harpford. Some of the specimens were nineteen inches in length. *Fœniculum vulgare* I did not meet with at Sidmouth, but gathered it on the old city walls at Exeter, the same habitat where *Bromus madritensis* grows. *Fedia dentata* was not unfrequent on the sandstone about Harpford. *Conyza squarrosa*: in Harpford Wood, and other places. *Anthemis nobilis*: plentiful in some spots on the Beacon and Peak Hills. I was unable, from inquiry, to ascertain the height of these hills, but it was generally supposed they might be between eight and nine hundred feet. *Lobelia urens*: last autumn, a specimen was gathered on the Beacon, or 'East Hill,' as it is sometimes called. This is its nearest habitat to Ottery St. Mary; but, owing to the unfavourable weather, I did not get to it, and it was early for flowers. This was the case with *Cuscuta Epithymum*, whose red threads nearly choked *Galium saxatile* and *Ulex nanus*. *Anchusa sempervirens*, with its bright blue flowers, attracted the eye in many places in the lanes about Harpford. It grew plentifully on the roadside near Ottery St. Mary, as well as near Sidmouth. I could not find that this beautiful weed was cultivated in the cottagers' gardens. *Lycopus europæus* we found at Sidmouth. *Galeobdolon luteum* was not uncommon on the hedgebanks, and in Harpford Wood. *Iris fœtidissima* was frequent enough to remind us of Sir William Hooker's objections to it. *Arenaria maritima*, α ., was very fine on Sidmouth cliffs. *Ruscus aculeatus* grew plentifully in Harpford Wood, though it seemed to select particular spots. The country people called it 'knee holly,' from its height. It is generally

used in that neighbourhood to ornament the churches with its beautiful berries at Christmas. Nothing could exceed the magnificence of the *Digitalis* in all quarters: we found some fine white-flowered plants, and also a white variety of *Ajuga reptans*. *Festuca bromoides* and *F. pseudo-myurus* grew on walls at Harpford and Sidmouth. I did not meet with any unusual or marked variety in ferns. They were all of the commoner species, but in size and luxuriance far surpassed any I had ever seen. I was much interested in discovering, on an ash-tree in Harpford Wood, a new lichen,—*Lecidea leucoplaca* of Chevallier, as a friend, who is conversant with the species, informs me it is called. *Sticta pulmonaria* of Hooker also grew on the same tree. The fronds were remarkably large, and some in fructification.” —*M. M. Atwood; Clifton Vale, Bristol, August 2, 1853.*

Lastrea Filix-mas and Ophioglossum vulgatum used in Medicine.

“I send you an extract from ‘The New Homœopathic Pharmacopœia and Posology:’—‘Tincture of *Polypodium Filix-mas*.—We gather the plant in the summer months. That which grows on stony declivities towards the North is considered the most efficacious. Of the recently dug roots we take the inner marrow, and we likewise take the youngest rudimentary leaves which are neither withered nor gangrened, of a bright green colour, a strong sweetish and offensive smell, and similar taste, which afterwards becomes bitterish, acerb, and slightly astringent. Both are stripped of their brown epidermis, after which we prepare according to class 2,’ &c.

“In a part of Herefordshire which is quite on the borders of Worcestershire, and in the parish of Whitbourne, the country people, in the spring, make what they call ‘May ointment,’ one of the ingredients in it being the adder’s-tongue fern (*Ophioglossum vulgatum*). It grows plentifully in a meadow in that district, and has been long in use as an important part of the ointment, which is composed of a variety of herbs, and is reckoned a panacea for bruises, tumours, &c. The leaves and stems are the parts used of the *Ophioglossum*.”—*Id.; August 6, 1853.*

New Locality for Cystopteris montana.

“Previously to my setting off for Scotland, on the 1st of this month, I was not able to get any information respecting the locality of *Cystopteris montana*, more than I obtained from the pages of the ‘Phytologist;’ and, when arrived within the district, in reply to my inquiries respecting Corrach Uachdar or D’oufillach, no one that I met with

had ever heard of such names, though I took great pains in making clear what ought to be its situation, and the way in which the names were spelled, not trusting to my pronunciation. Such being the case, I was obliged to trust to myself, and search diligently, and had the pleasure of discovering a locality for the said fern, which I suppose to be the third in which it has been found in Scotland. It is not Mr. Borrer's station, directions for which I have since received, but may be six to eight miles distant from it. I found one frond only in fruit. It is, indeed, a most delicate and beautiful fern. The rhizoma is creeping, as in *P. Dryopteris*. Habit:—stipes erect; the upper portion of the frond nearly horizontal, consequently it has somewhat of an elbow at the junction, though not so much as in *P. Dryopteris*; the ends of the pinnae and frond are rather depressed, as far as I recollect. The figure in Newman's 'Ferns' is good, and represents a full-sized specimen. The stipes is generally half the total length of the frond; fronds from 2 to 6 inches in length, not rigid, of a delicate pale green; substance as delicate and fragile as *C. fragilis* grown in shady places. Habitat:—mountain ravines, on ledges of rock, in moist situations; rhizoma creeping among moss, and throwing up its fronds sparingly."—*Thomas Westcombe; August 22, 1853.*

Note on Pseudathyrium flexile.

"I have not met with this again, and suspect that it is quite of rare occurrence. I did not revisit the glen in which we found it; and if it should not be found in more places, I should be cautious of giving directions to its site. I think that it is quite distinct from *P. alpestre*; and if it had not been already brought forward as a distinct species, I should have done so. The two plants look quite different in cultivation. The frond of *P. flexile* is linear-lanceolate, with the pinnae short and decidedly deflexed; it fruits in quite a small state, as compared with *P. alpestre*; indeed, I have never seen the latter in fruit, except in large, strong plants, in which case it bears a strong resemblance to *Athyrium Filix-fœmina*. I have a good-sized plant in my garden, but it shows no sign of fructification; whereas my *P. flexile*, though less than six inches in length, is in fruit. The latter is grown in pots, in a cold frame. I am not sure that we found both plants growing together, but I am inclined to think that we did. *P. alpestre* I found sparingly on Benlawers, abundantly in Canlochen and Glen Callater. I have roots from these three places. I observed very little in fructification; in fact, none worth preserving, under the circumstance of my press being nearly full."—*Id.*

Trifolium patens near Ashby-de-la-Zouch.

"I send you a specimen of *Trifolium patens*, Schreber, which my friend Coleman lately discovered, growing on the embankment of the Burton and Leicester Railway, near Ashby-de-la-Zouch. It has probably been introduced with seeds from abroad, about four years ago, when the embankment was made. A quantity of *Crepis setosa* was growing near it, and also on other parts of the embankment, some distance from the spot; but there was only one rather large patch of *T. patens*. It is, I believe, a denizen of Germany, and other parts of Europe."—*Andrew Bloxam; Twycross, Atherstone, August 25, 1853.*

Adiantum Capillus-Veneris near Bath.

"I found three plants of this fern, growing in the air-shaft of a stone-quarry, some thirty feet below the ground, at Combdow, near Bath. Master Millett has also found another Cornish locality, about two miles from the well-known one at St. Ives. My plants of this fern, grown in pots, surprise most botanists, from their attaining a very large size, some fronds being a foot long. They are grown in a very rich soil, having plenty of leaf-mould, and the pots kept in a cool greenhouse. A plant has kept alive for three years, in our fernery, without protection."—*E. J. Lowe; Observatory, Beeston, near Nottingham.*

Fungus in the Heart of an Oak-tree.

"The very day that I had been reading Prof. Quekett's account of a fungus in the heart of a living oak (*Phytol.* iv. 945), I happened to be superintending some bark-peelers; when my attention was directed to an oak, which was partially decayed at the centre, towards the root, and the decayed wood mottled all over with patches of a white fungus. The tree was quite sound all round the circumference, and exhibited no marks of decay externally; and I had no suspicion of its being faulty, when I marked it for falling. Here there is another instance of a fungus in the heart of a living oak, which, Prof. Quekett thinks, has never before been recorded. I enclose a specimen."—*W. T. Bree; Allesley Rectory, Coventry.*

Udora Canadensis at Stafford.

"This interesting but unwelcome stranger has found its way here, within the last two years. The men who have charge of the river first observed it last year; and now it forms huge banks of vegetation in

the river, below the town, where it seems likely to become as great a nuisance as it is in Cambridgeshire. Its habitats are thus advanced from the Derbyshire border, at Burton-upon-Trent, to the centre of the county. Our dirty little stream (aptly named the Sow) flows into the Trent; so that the two localities have a very direct water-communication with each other. How it was introduced here, I cannot ascertain. Its existence so near home was unknown to me until yesterday, when, taking a botanical stroll with a friend, this remarkable addition to our local Flora came under our observation."—*R. C. Douglas, M.A.; Forebridge, Stafford, August 23, 1853.*

Udora Canadensis in the Valley of the Severn.

"While taking a botanical stroll, yesterday evening, I found a small patch of *Udora Canadensis*, in a pool near the river Severn, but unconnected with it, except by floods, near Bevere Island, about three miles from Worcester, up the river. I believe this is the first time it has been found in this *district*, though it was discovered in this *county*, in the Avon, at Evesham, in June last, by Mr. W. Cheshire."—*Thomas Baxter.*

Lastrea rigida near Bath.

"I beg to enclose a frond of what I believe to be the true *Lastrea rigida*. I found a single plant, bearing only four fronds, in a somewhat bleak and exposed situation, within a few miles of Bath. I searched diligently for other plants, but without success."—*John E. Vize; Town Mills, Bath, September 19, 1853.*

The President, without hesitation, pronounced the frond which was exhibited to be *Lastrea rigida*, and in no way distinguishable from the same plant as found near Settle, in Yorkshire.

WORCESTERSHIRE NATURALISTS' FIELD CLUB.

Meeting in Wyre Forest.

A meeting of this Club took place in the latter part of August, within the shady coverts of Wyre Forest, under the Presidency of the Rev. Canon Cradock. "Stately Wyre" has been celebrated in the strains of Michael Drayton, and its venerated *sorb-tree* is noticed in the 'Philosophical Transactions,' for 1678. The party were anxious to examine the old *Pyrus domestica*, or true service-tree, the only one

known of the species, apparently wild, in any part of Britain. It is full a mile within the forest, and surrounded with dense underwood. Thin and decrepid, quite bare of foliage below, it now extends its lank arms a considerable height in air, and is only verdant at the extremities of these lofty branches. In fact, it is in the last stage of decay, and a few more years will probably leave it a mere weather-battered trunk. Only this single tree of the *Pyrus domestica* has at any time been found within the forest precincts, and how it got there is unknown ; but, as it is probable there would have been others, if it had been indigenous at the spot, the inference would seem to be that it was brought from abroad. Mr. Lees at this time pointed out a mound of broken stones and débris, now overgrown with brambles, not far from the tree, which seemed like the ruins of an old dwelling, and suggested that an hermitage might have been formerly there, and the tree brought from Aquitaine, by some recluse in the time of Edward III., when the English, under the Black Prince, occupied that duchy. There was an undoubted feeling of superstitious protection attached to the tree, whose fruit was commonly said, by the foresters living in the vicinity, "to keep out the witch" from their habitations ; and for this reason they hung up the hard fruit, which would remain a long time without decaying, in their houses. The tree is commonly called by the foresters the *Whitty*, or *Witten*, pear ; perhaps derived from the old English word *witten*, to know, meaning the *wise tree*. They distinguish it from the mountain ash, which they simply call *Witchen* ; and though a protective power is attributed to a stick of that tree, yet the "Whitty pear," they say, is "stronger." So, in the 'Arabian Nights,' the Genius of the Lamp was more powerful than the Genius of the Ring.

From the worn-out "service-tree," the party progressed on, among undulated oaken copses and watered ravines, to the brown horrors of sylvan shades, where the dense underwood spread a cloak, repulsive to observation ; but here and there an opening space exhibited an old charcoal-heap, characterized by a peculiar vegetation, which Nature ever provides for secluded spots. Here was the *Marchantia polymorpha*, with its remarkable umbrella-like receptacles, spreading out like stars (both barren and fertile) ; brilliant scarlet patches of the local fungus, *Thelephora carbonaria*, contrasting so well with the blackened soil ; and the hygrometrical moss (*Funaria hygrometica*), always following the track of fire along the charred ground. Still proceeding through mazes of gorse and bilberry-thickets, a great bog was entered upon, embowered and completely surrounded by thick

umbrage, where nothing could be seen but continuous forest, clothing hill and dale. A pretty scene was presented at this bog of undulating banks, covered with soft, yielding *Sphagnum*, with water gushing into every hollow, the whole profusely clothed with the tall *Eriophorum latifolium*, dangling its glossy tassels, white as ermine, with here and there the purple-flowered *Epipactis palustris*, and the fragrant *Gymnadenia conopsea*. A good deal of *Molinia cærulea* grew here, with fine purple spikes of flowers, and the borders of the bog were adorned with numerous bushes of *Rhamnus Frangula*, exhibiting a profusion of rose-coloured and black berries. About this spot, the silver-washed and dark green Fritillary butterflies (*Argynnis Paphia* and *A. Aglaia*) were observed, adding to the beauty of the scene. Here, also, *Carex pulicaris* and *C. fulva* were gathered.

The banks of Dowles Brook, now shaggy with flowering ling, were next traversed; and in the further progress to Park Brook, amidst glades filled with the bright *Erica cinerea*, profusely covered with purple bells, some beautiful, though secluded, sylvan features came into view. Here the party for some distance were obliged to proceed in Indian trail, from the close and dense investiture of verdure; but the fatigue was repaid on arriving at Park Brook, which, wandering at its own free will down a deep ravine, exhibits many most enchanting glimpses of rock, wood, and waterfall, charming to the lover of Nature, though on a confined scale. This gloomy and damp part of the forest has many charms for the botanical wanderer; and on the present occasion there were gathered the columbine and wood geranium, the elegant *Pyrolas* (*P. media* and *P. minor*), *Gentiana campestris*, *Gnaphalium sylvaticum*, *Hypericum dubium*, *Convallaria majalis*, *Hieracium umbellatum*, *Sanguisorba officinalis*, *Listera Nidus-avis*, and the pretty *Melica nutans*, in abundance. Among brambles, the less common ones were *R. Guntheri*, *R. hirtus*, and a variety of *R. Lejeunii*, as well as *R. saxatilis*. One traverse was made, across Dowles Brook, into Shropshire; for Mr. Jordan, of Bewdley, had remarked, that although *Geranium sanguineum* was plentiful on the Shropshire side of the brook, it never had the civility to step over into Worcestershire, much as he wished it. Close to the mouth of Dowles Brook, the water ouzel (*Cinclus aquaticus*) was started, which is a rare bird in Worcestershire; and here, on the banks of the Severn, *Spiræa salicifolia* and the beautiful *Coronilla varia* were observed to be growing luxuriantly, but certainly in a naturalized state. Mr. Jordan said the *Spiræa* had been there a great many years. Dowles Church was passed on the way to Bewdley, and *Ceterach officinarum*

noticed on its brick walls. The Club dined at the 'George' Hotel, where, afterwards, various remarks were made in reference to the country examined and the objects seen, by the Rev. Canon Cradock, Mr. E. Lees, V.P., and Mr. W. Mathews. Mr. Baxter exhibited specimens of *Udora Canadensis*, now first found in Worcestershire, gathered by him a few days previously in a marshy pond at Grimley. Mr. Lees inferred that it must have been brought down the Severn by the autumn or spring flood, as his friend, the Rev. Andrew Bloxam, had seen it growing in the Severn, at Shrewsbury, in the present spring. That the plant was carried through the country by inundations, Mr. Lees said was quite clear; for during the late flood on the river Avon, in July last, while the hay was floating on the water at Evesham, Mr. W. Cheshire, jun., of Stratford, who happened to be there, took up a quantity with a fork, and, floating under the hay, appeared numerous stems of the *Udora*, which had thus been carried along by the impetus of the hay coming in contact with it. The *Udora* would now, doubtless, soon be common both in Worcestershire and Gloucestershire. The party returned to Kidderminster and Worcester, after a long, but most delightful, day.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Sulphide of Calcium as a Remedy for the Grape Disease.

A paper by Dr. Astley P. Price, 'On the Employment of the higher Sulphides of Calcium as a Means of Preventing and Destroying the *Oidium Tuckeri*, or Grape Disease,' was read.

"Of the many substances which have been employed to arrest the devastating effects of this disease, none appear to have been so pre-eminently successful as sulphur, whether employed in the state of powder or flowers of sulphur, or by sublimation in houses so affected. Notwithstanding the several methods described for its application to the vines, I am not aware that any had been offered in 1851, when these experiments were instituted, by which sulphur might be uniformly distributed over the branches, and be there deposited in such a manner as to be to some extent firmly attached to the vine. Three houses at Margate, in the vicinity of the one in which the disease first made its appearance in England, having been for the space of five years infected with the disease, and notwithstanding the employment of sulphur as powdered and flowers of sulphur, no abatement in its

ravages could be discovered,—I was induced to employ a solution of pentasulphide of calcium, a solution of which having been found to act in no way injuriously to the young and delicate shoots of several plants, was applied to the juices in a dilute condition; the object in view being that the compound should be decomposed by carbonic acid, and that the excess of sulphur should be deposited with the carbonate of lime in a uniform and durable covering on the stems and branches of the vines. This was adopted, and although but few applications were made, the stems became coated with a deposit of sulphur, and the disease gradually but effectually diminished, in so much that the houses are now entirely free from any trace of disease or symptoms of infection. The young shoots are in no way injured by its application, and the older wood covered with this deposit of sulphur continues exceedingly healthy. This was, we believe, the first employment of the higher sulphides of calcium as a vehicle for the application of sulphur to the stems and foliage of diseased vines. Specimens were exhibited from vines which in 1851 were covered with disease, and which have since the autumn of that year received no further treatment. The vines in the immediate neighbourhood, and adjoining one of the houses, are covered with the disease, but, notwithstanding their close proximity, no indication of the disease has at present been detected in either of the three houses.”

Effect of Sulphate Lime upon Vegetable Substances.

A paper by Chevalier Claussen, ‘On the Effect of Sulphate of Lime upon Vegetable Substances,’ was read.

“About six weeks since I was engaged in making various experiments on the effect of sulphate of lime upon vegetable substances. A portion of the substances then used by me was thrown carelessly aside, and upon returning to my experiments about a fortnight afterwards, I was surprised to find that decomposition had not taken place in those portions of the vegetables which had been subjected to the action of the sulphate, while those which had not been so treated were completely decayed. Among the articles experimented upon were a number of potatoes, each of which was affected by the prevalent disease; some of these remain sound to the present day, the others have some time since completely rotted away. Subsequently, I procured some more potatoes, and also some beet-roots, the former being, as far as I could judge, all diseased. I divided the potatoes into three portions. One lot I placed in a vessel with a weak solution of sulphuric acid, and from thence I placed them in a solution of

weak lime-water. In the second lot the process was reversed, that is to say, the potatoes were first placed in the lime-water, and then in the acid. The third lot was left untouched. Ten days afterwards I examined the potatoes, and found, as I expected, that the potatoes which had not been treated with the sulphate were rapidly decaying,—those which had been first placed in the solution of lime and then in the acid were more nearly decomposed,—while those which had been treated in the mode first described remained as sound as when first taken in hand. Upon being cut open the diseased part of the potatoes was not found to have spread internally, and the flavour of the root was in no degree affected by the application of the process, nor do I think that its germinating power was injured by the effect of the sulphate. The effect upon the beet-roots was similar to that produced upon the potatoes, and which would seem to be somewhat analogous to that of galvanizing metals, *viz.*, protecting the substances from the effect of atmospheric agencies. I may add, that muriatic and other acids have been employed by me on other occasions with equal success, the only agents required appearing to be those which will most readily produce a sulphate in contact with the substances required to be preserved. As at present it does not appear that any means can be successfully adopted to prevent the potato from becoming diseased while in the ground and arriving at maturity, it would certainly be of immense advantage if anything could be discovered by the use of which the roots when taken up could be prevented from that absolute decay and irreparable loss to which potatoes affected by the disease are liable. The results which I have described seem to me to point to the possibility of arresting this loss. How far the plan suggested may be practicable or applicable upon a large scale, my present very pressing and numerous engagements have hitherto prevented me from ascertaining. I do not think that any insuperable difficulty exists with respect to the application of the process. The acid employed by me was very weak, about one part to two hundred of water; the lime-water was about the consistency of milk. The materials are not, therefore, expensive; and when the value of the crop to be saved is taken into consideration, it would be a matter well worthy of being tested by some of those extensive growers of potatoes in the county in which the British Association is now holding its sittings. For my own part, I should be most happy if by any suggestion of mine I had merely been the instrument of directing the attention of scientific men to the subject of the possibility of preserving from total destruction a vegetable so valuable and so indispensable as the potato.”

Utricular Structure of the Endochrome in a Species of Conferva.

A paper by Prof. Allman, 'On the Utricular Structure of the Endochrome in a Species of Conferva,' was read.

The plant which constituted the subject of the communication, is closely allied to *Conferva Linum*, and the author showed that the deep green endochrome, when liberated from the cell, is seen to possess a very definite utricular structure. Each utricle is filled with homogeneous green matter, which surrounds one or more peculiarly formed starch granules. In many instances, urticles were met with of a large size, and filled with a brood of secondary urticles, each containing homogeneous green contents, surrounding a nucleus-like starch granule.

A long discussion followed the reading of this paper—which ultimately turned upon the distinctions existing between the animal and the vegetable kingdoms.

Dr. Redfern dwelt on the importance of recognizing the function of cell contents, as well as of cell-walls. Physiologists were too prone to recognize the cell-wall, to the exclusion of what it contained.

Dr. Walker-Arnott stated that he had recently heard that starch had been found in the *Medusæ*. If this were the case, the existence of starch could be no longer claimed as characteristic of the vegetable kingdom.

Prof. Allman agreed with Dr. Lankester that the best expression to be found for animal and vegetable life at present was, the general fact of vegetable tissue giving off oxygen gas, and absorbing carbonic acid, whilst animal tissue absorbed oxygen and gave off carbonic acid.

Diatomaceæ found in the Vicinity of Hull.

Mr. J. D. Sollitt read a paper, prepared by himself, in conjunction with Mr. R. Harrison, 'On the Diatomaceæ found in the Vicinity of Hull,' showing that the freshwater and marine Diatomaceæ were exceedingly numerous in this locality; the beauty of the varied forms of which were such as to delight the microscopist, and, at the same time, some of them are highly useful as forming that class of *test objects* for microscopes which are the best calculated of all others for determining the excellence and powers of object glasses. As test objects they were first discovered by the Hull microscopists,—and have now been adopted as such by all the microscopists not only in this but in all other countries. Mr. Harrison and Mr. Sollitt discovered the markings on those delicate siliceous coverings as early as 1841. It was shown that the markings on those shells were so fine as to range between 34,000 to 130,000 to the inch; the *Plurosigma*

strigilis being the strongest marked, and the *Navicula Acus* the finest. It was afterwards pointed out that a large bed of fossil freshwater *Diatomaceæ*, of at least two feet in thickness, had been discovered in Holderness,—and that in a submerged forest on the coast of Holderness numbers of fossil freshwater *Diatomaceæ* had been discovered, although the sea flows over the part at every tide. The paper concluded by pointing out that upwards of 150 species of marine and freshwater *Diatomaceæ* had been identified in the neighbourhood of Hull.

The reading of this paper was followed by a long discussion. First, in relation to the microscopic powers and the structure of the instruments employed by the Hull observers. Secondly, with regard to the nature of the lines found on the surface of the *Diatomaceæ*. Thirdly, on the question of the vegetable or animal nature of the *Diatomaceæ*. From the statement of Mr. Sollitt and Mr. Harrison, it appeared that the lenses which they had employed for the minuter markings were object-glasses of Nacet's manufacture, the one-sixteenth and the one-eighth of an inch focal distance, with angles of aperture of 115° and 105° diameter, and for the larger markings one-fourth of Smith's, with an aperture of 46° . With these glasses they had detected markings whose interspaces numbered 130,000 to the inch. Mr. Sollitt regarded the lines as consisting of rows of minute tubercles, which gave the appearance of continuous lines.

Dr. Walker-Arnott considered that these curious beings must now be regarded as plants.

Prof. Allman looked upon them as the starting-point of Nature in which the mineral, animal, and vegetable laws of creation were struggling for ascendancy.

Mr. Sollitt and Mr. Harrison regarded them as animals, and quoted the opinion of Prof. Bailey of New York.

Prof. Balfour referred to their resemblance to *Desmideæ*, and the conjugation observed amongst them as conclusive proofs of their relation to the *Confervæ*, whose vegetable nature no one doubted.

Dr. Lankester referred to Schleiden's objection, of their possessing a highly complicated structure, and pointed out their resemblance to the *Foraminifera*, which all agreed to be animals. It had, however, been asserted that the *Diatomaceæ* possessed starch, and as yet this had not been discovered as a secreted product in beings recognized as truly animals, whilst starch was universally present in true vegetable productions.

Botanical Notes and Observations on Plants observed in Essex, during the year 1852. By E. G. VARENNE, Esq.

Ranunculus cœnosus, Guss. On the margins of a moat at Great Totham.

Barbarea vulgaris, L. This common weed is marked "perennial" by Smith, and Hooker & Arnott; and "biennial?" by Babington. It is most probable that the former writers are correct in their idea of the duration of *B. vulgaris*, from the fact of the withered stems of the previous year being commonly found attached to the root of the growing stems of the plant, in spring and early summer.

Three varieties of *Barbarea vulgaris* are found in this part of the county of Essex:—

1. The common form of descriptive writers.
2. An arcuate form, which grows with a large top, on very damp banks by the brook-side at Rivenhall.
3. A form bearing a close resemblance to, if it be not identical with, *Barbarea stricta*, *Andr.*, and which is only to be found on very dry banks.

Hypericum perforatum, L. There are two distinct varieties of this species to be found about Kelvedon. These varieties are distinguishable by the form and size of the segments of the calyx.

1. The first variety is the ordinary form of the species, in which the sepals are erect, lanceolate and acute, imparting a very bristly appearance to the young flower-buds. The foliage of this first variety is of a peculiar light green, and it varies with narrow oblong and broader oblong leaves.
2. In the second variety, the sepals are half the length of those of the ordinary form, and broader. They are ovate, lanceolate, mucronate, and impart a very blunt appearance to the young flower-buds. They are distinctly reflexed in the early condition of the flower; and when the fruit is well developed the ends of the sepals retain the reflexed character. The foliage of the plants belonging to this variety is of a dark green colour above, very glaucous beneath; and the veins of the leaves being more distant, the intervening reticulations cause them to present a more pellucid appearance than is to be met with in those of the ordinary form. The form and shape of the leaves vary in this, as they do in those of the first variety. In the larger-leaved plants, moreover, the leaves assume an

obovate form. Indeed, there is reason to believe that the plants of this second variety are sometimes named *Hypericum maculatum* by botanists ; and I once met with a good specimen of it intermixed with a number of specimens of *H. dubium*, which were sent to me by a botanical friend. This fact is mentioned for the purpose of indicating the strong resemblance a certain form of *H. perforatum* bears to *H. dubium*. The second variety of *Hypericum perforatum* is a permanent one, and has remained constant to its characters, in very many situations, for several years. It may be presumed that the range of its localities is not very limited, as it appears to have attracted the notice of the late Dr. Bromfield in Hampshire, and is mentioned by him in the 'Phytologist' (iii. 272).

Melilotus arvensis, Wallr. Clover-field, Kelvedon.

Melilotus vulgaris, Wallr. Clover-field, Kelvedon.

Trifolium elegans, Savi. Has maintained its position for some years about the sides of certain hilly fields of corn-land at Great Braxted ; but to the history of its introduction no clew can be obtained.

Epilobium roseum, L. "Scions none," *Hook. & Arnott* ; "scions wanting," *Babington*. On the Kelvedon plants of this species, short scions, terminated by a rosette, are found in the autumn. Scions are also denied to *Epilobium montanum*, L., by the same authors ; but, nevertheless, long suckers are to be found attached to the lowermost underground joints of the stem ? of that species. In their young condition, these suckers are faithfully delineated by the artist in 'English Botany,' plate 1177 ; and Smith says of the root of *Epilobium montanum*, L. ('English Flora,' vol. ii. p. 214), that it has "red shoots."

Helminthia echioides, Gærtner. "Annual," *Smith* and *Babington* ; "perennial," *Hook. & Arnott*. This plant might well appear to be only of a biennial character, to a person who had merely observed its autumnal tuft of leaves, succeeded by stem and flowers in the ensuing year. And to such an extent I was, for some time, accustomed to view its duration. But, in reference to the perennial character ascribed to *Helminthia echioides* by Hooker & Arnott, I must remark that I believe those writers to be correct in extending the duration of the plant from the biennial to the perennial character ; for I have seen young and vigorous stems of *H. echioides*, growing in lately cleared woods, side by side with the decayed stems of the past year.

The apparent preference for viatical situations, on the part of *H. echioides*, appears to arise from the fact, that in such situations the growth of the plant is not interfered with in the early stages. Indeed, were it not for the proceedings of husbandry, *H. echioides* would be a much more common plant than it is now on the stronger soils of this county; for, as it first throws out its leaves in the autumnal period of the year, it is liable to be destroyed in our fields, by the agricultural operations then going on. The finest specimens of this not inelegant weed I ever met with, and they were numerous enough, were in a field of cole-wort left for seed. Here the young plants of the bristly ox-tongue were not cut up in the autumn; and when full-grown they were equally secure from destruction, because their eradication would have caused more damage to the crop than was incurred by allowing them to remain.

Cuscuta Hassiaca, Pf. In a field of lucerne at Rawreth; just coming into flower on the 1st of September, 1852.

Marrubium vulgare, L. Has extended itself, during the last two or three years, over some parts of the remains of Old Tiptree Heath, and is particularly abundant on a bank of newly enclosed land. It would not be right to leave unnoticed the fact, that the horehound had long been growing in some cottage garden-ground close to the new banks; but in other parts of the Heath, where solitary plants of *Marrubium vulgare* are occasionally to be found, no gardens containing the horehound exist.

Chenopodium album, L. The large, green-looking weeds that are found growing on dung-heaps, and in rich ground, and which are known by the above name, cannot be the exact type of the species which Linneus had in view when he adopted the concise definition of Tournefort, "*Chenopodium folio sinuato candicante*," as expressive of the character of this common plant. In the neighbourhood of Kelvedon, the specimens of *Chenopodium album*, corresponding with the definition of Tournefort, and agreeing in appearance and character with specimens in the Linnean herbarium (as I am politely informed by Mr. Watson), are to be found, in a scattered as well as in a gregarious manner, in the sides and corners of corn-fields, among wheat, barley, oats, and beans. In such situations, but most particularly on light soils, they are to be met with all over the eastern portion of the county of Essex. They are also occasionally found growing in gravel-pits, and on gravelly banks, and are then often accompanied by the more robust green-leaved form of the species, and by the variety known as *Chenopodium viride*.

When young, the typical form of *Chenopodium album* presents a very pale green colour of the stem and foliage, which pale green colour passes into various shades of red and white, as the age of the plant increases. For instance, when the flowers are fully formed the margins of the leaves put on a roseate tint, which tint, as the fruit ripens, extends over more or less of the surface of the leaf. The perianth, at a still later period, becomes also of a similar roseate hue, or else a deep red colour is found diffused over it; and at the same time the stem is striated with white and green lines, harmoniously shaded off with pink. The stem is usually simple and upright, having but few leaves, and is terminated by short branches, which bear the panicles of fruit; so that the plant presents something of the aspect of small specimens of *Atriplex deltoidea*. In the more robust specimens, the panicles of inflorescence become elongated, having the terminal flower stalked and larger than the others, and the numerous lengthened fruit-bearing branches tower above the few leaves of the stem.

The form of the leaves is variable; but these organs are generally broad, in proportion to their length. The fugacious lowermost leaves are roundish ovate, rather triangular or deltoid at the base, irregularly sinuate-dentate at the margins, and rounded off at the end. The middle leaves are narrower than the lowermost, more rhomboid; some of them very acute at the apex, and very irregularly as well as deeply indented at the margins. The middle as well as the lower leaves are characterized by a distinct tendency to the three-lobed form. The uppermost leaves are lanceolate and entire, degenerating into bracteas at the base of the inflorescence. All the leaves are more or less glaucous and mealy beneath, when young.

The fruit is variable in size, and covered by a perianth, larger and more fully developed than is the same part in the luxuriant variety of rich soils. When the fruit is first formed, the filmy, white pericarp easily rubs off, and the exposed seed is black, shining, and very minutely striate-dotted. After a period, the transparent, easily removable pericarp of the early state of the fruit hardens, and becomes opaque, of a brown colour, and covered with whitish papillæ. It is very difficult to remove the hardened pericarp from the seed. In the well-formed and fully developed fruit, the lower portion is decidedly more convex than the upper, its shape being like that of a bun. The keel of the margin is variable, and not always present. After the process of fructification is perfected, the segments of the strongly keeled perianth separate, and expose the fruit. The gay appearance of the

stem and foliage, and the exposed mature fruit, are more or less characteristic of the typical *Chenopodium album*. In the dung-hill and green-leaved plants, the entire perianth appears to turn whitish brown, and dies off without exposing the fruit; which latter assumes the opaque, grayish appearance much later than the fruit of the rosy-leaved plants; and its pericarp, when hardened and dull, is more readily removed.

There is a variety of *Chenopodium album*, growing in garden-grounds, amongst potatoes and other vegetables, which presents various colours about the stem, and margins of the leaves, and is more particularly red or purplish about the base of the stem and branches. The plants of this form branch but little in the lower part, though they attain the height of three feet, or more. The upper part of these weeds is conspicuous at a distance, with long, leafless branches, bearing panicles of inflorescence; the whole plant in habit bearing a resemblance to *Artemisia vulgaris*: the abundant inflorescence attracting the attention, by its excess over the foliage, as in the last-named plant. The leaves of this variety correspond with those of the corn-field plants, excepting in size, and in the lower ones being distantly dotted on the upper surface with mealy points. The early condition of the fruit has the seed microscopically punctate; but I have had no opportunity of observing the fruit when fully ripe, because these larger things are, sooner or later, exterminated by the gardeners. The corn-field plants, on the contrary, are more secure from invasion, being protected by the respect shown to the crop under whose shadow they grow. Thus it is that they are allowed to remain undisturbed until the harvest operations begin, at which period their fruit is mostly perfected.

In the punctulation of the seed, and in the shape of the fruit, the typical *Chenopodium album* approaches *Chenopodium ficifolium*, with which latter plant I confess myself at first to have confounded it; but, independently of the difference of foliage, the fruit of *C. ficifolium* is much smaller than that of *C. album*. I am not able, at present, to affirm that all the forms of *Chenopodium album* have the seeds striated and minutely dotted, as are those of the typical form; but I nevertheless believe that the dots and markings are not so perceptible in the seeds of the dung-hill form of *C. album*; for although our descriptive writers have varied in their characters of the seed of *Chenopodium album*, none of them mention the seeds as being minutely punctulate.

The following extracts from the works of authors of best repute illustrate the discrepancy alluded to :—

“Seed perfectly even, not dotted.”—*Smith*, ‘English Flora,’ vol. ii. p. 13.

“Fruit smooth.”—*Hooker*, ‘British Flora,’ 1st ed. p. 277.

“Seeds smooth, shining, bluntly keeled at the edge.”—*Ibid.*, 6th ed. p. 245.

“Seeds depressed, smooth and shining, margins obtuse.”—*Leighton*, ‘Flora of Shropshire,’ p. 123.

“Seeds orbicular, depressed, smooth and shining, convex on both sides, obtusely but distinctly keeled on the margins.”—*Ibid.*, 515.

“Seeds horizontal, smooth and shining, obtusely keeled at the margin.”—*Babington*, ‘Manual,’ 3rd ed. p. 267.

I must crave the indulgence of the readers of the ‘Phytologist’ for trespassing thus prominently on their attention with the foregoing description of the typical form of *Chenopodium album*. Indeed, I am led to understand that this form of the species has puzzled some good botanists; and in these discriminating times one might have felt inclined to consider it as something specifically different from the form of *Chenopodium album* delineated in *Smith’s* plate. But cultivation soon settles the point, for the seeds of the small and roseate forms spring up into large, green-leaved plants, if sown in a suitable soil.

As they occur about Kelvedon, the varieties of *Chenopodium album* may be arranged as follows :—

1. The roseate, or typical form. *Chenopodium folio sinuato, candicante*.
2. The green-leaved, or dung-heap form of *Smith’s* plant.
3. The *Chenopodium viride*, *L.*
4. The form with lanceolate, entire leaves.
5. An autumnal form, occurring, unlike the others, on strong land; in leaves and inflorescence resembling *Chenopodium murale*. The seeds of this variety I have been unable to meet with. It seems an approximation to the *C. pedunculare* of *Woods’* ‘Tourist’s Flora.’

I cannot conclude these observations on *Chenopodium album* without stating my obligations to Mr. Borrer, for allowing me to trouble him with my inquiries on the subject.

Chenopodium ficifolium, Sm. Turnip-field, Great Tey; dung-heap, Inworth.

Lolium italicum, Braun. Often occurs in the neighbourhood of Kelvedon, in the corners and sides of corn-fields, and amongst clover. It also grows in the meadows. Its introduction of late years amongst clover-seed, is very probable ; but, if this grass be merely a variety of *Lolium perenne*, its growth in the meadows may admit of a different explanation.

E. G. VARENNE.

Kelvedon, September 26, 1853.

Notes on the Localities of certain Hampshire Plants, observed in August and September, 1853. By A. IRVINE, Esq.

OUR object in visiting Southampton and the Isle of Wight was not strictly botanical, but rather for the sake of relaxation and recreation : hence the number of species noted is not so numerous as they might have been if we had had this as our sole motive for undertaking the journey ; but they are not therefore the less interesting. Every fact bearing on the Botany of a district which has been amply investigated by the late Dr. Bromfield and others, cannot fail of possessing an interest among all who love the science and desire its extension. The only plant of great interest about Southampton is *Spartina alterniflora*, which grows plentifully on both sides of the Itchin, both above and below Northam Bridge. The other species, *S. stricta*, is said to grow with the former ; but we did not see it. On a rubbishy part of the shore, were gathered *Plantago pumila*? *Medicago denticulata*, and a few exotic *Cruciferæ*, which I have observed, for two years, growing with numbers of foreign plants, near the steam-boat pier at Wands-worth. This fact proves that several species not British are extending themselves, and probably, at some future period, will be ranked among the semi-naturalized denizens of the British Isles. On the shore of the Southampton Water, as it is called, there is a large patch of *Spartina alterniflora*, about half-way between Netley Abbey and Southampton. The only vegetation of the pebbly beach of this part of the estuary is *Glaucum corniculatum* [?], *Silene maritima*, and a very few commoner plants. *Aster Tripolium* grows in muddy parts, and in the adjoining ditches. In the ruins of Netley Abbey we noticed *Atropa Belladonna*, only one poor plant, neither in flower nor in fruit. On the roadside near the Abbey, returning by the heath to Itchin Ferry, *Dianthus Armeria* was found in considerable plenty. *Hypericum Androsæmum* and *H. calycinum* were also noticed near South-

ampton, but neither of them in places sufficiently remote from cultivation to warrant their being, here at least, considered indigenous.

About Carisbrooke Castle, near Newport, Isle of Wight, we gathered *Iris fœtida* [?], *Gentiana Amarella*, and, on the rampart wall, *Centranthus ruber*. On a ledge near the window of King Charles's apartment, pointed out to all visitors, there is a fine plant of *Lathyrus latifolius*, well established and very characteristic. In Parkhurst Forest, about two miles from Newport, there is a very luxuriant form of *Cnicus pratensis*, nearly two yards high, and bearing from three to four leaves. There is also a form of *Scutellaria minor*, from two to three feet high, very straggling in its growth, but agreeing sufficiently with the common form in every character, except habit and size, and not approaching to *S. galericulata*. The radiate form of *Centaurea nigra* is the rule here, as in all the western parts of the Island visited by me, where this plant grows; and the common form is the exception. About Freshwater there is a *Mentha*, not uncommon, which I took for *M. sylvestris*. A stalk of *Lavatera arborea*, with fruit on its branches, was found among the rejectamenta of the sea; also a few stalks of the sea stock (*Matthiolum maritimum*) [?]. The vegetation of the downs at Freshwater, and all along the coast by the Beacon, the Needles Lighthouse, Alum Bay, &c., is of a remarkably stunted nature. *Daucus Carota* was scarcely half an inch high; yet it bore an umbel of flowers. *Campanula glomerata* was rarely found above an inch high, and usually with a single flower. *Gentiana Amarella* was also invariably found with four segments both in the calyx and corolla, and those of the latter usually more rounded than in the common form of this plant. About Yarmouth, *Spartina stricta* is plentiful, both on the Yar and in a salt-marsh going towards Sconce Point. On the sandy beach which separates the sea from this marsh, *Eryngo maritima* [?] was very fine and plentiful; also *Psamma arenaria*, *Convolvulus Soldanella* (only in leaf), *Asparagus officinalis*, *Fœniculum vulgare* (the former plentiful, the latter very sparingly), *Cakile maritima*, and a few other less interesting species. On the downs above Sconce Point was observed *Spiranthes autumnalis*, very sparingly. This plant is eaten off by the sheep; on the cow-pasture, it was not so scarce along the coast. *Erythræa pulchella*, a very dwarf form, was not scarce; *Hyoscyamus niger*, where the fort is building. About Yarmouth, *Borago officinalis* is plentiful in a lane, both on the bank and in the ditch (a dry one); also *Lycium barbarum*, what is vulgarly called the "tea-plant" about London. In the gardens grew, as a weed,

Linaria purpurea; also a *Coronilla*. Although the temperature of Yarmouth appeared (felt) to us lower than that of London by several degrees, yet the growth of certain plants in the open air, or only slightly protected, shows that the annual temperature is higher than that of London. Fuchsias of immense size were quite common in almost every garden, as were also Hydrangeas and myrtles, both flowering beautifully. We noticed *Aloysia citriodora*, the lemon-scented *Verbena*, as it is commonly called, not much less than twenty feet high, and of a moderate thickness: this plant was supported by a wall. On the road from Yarmouth Ferry to Freshwater, *Hypericum calycinum* was noticed in a copse, along with plenty of *Rubia peregrina*. The latter plant is common in the hedges on the west side of the Yar. *Iris fœtida* [?] abounds between Yarmouth and Newtown; and on the coast in the same direction large specimens of *Erythræa pulchella* occur, some of them not less than from eighteen inches to two feet high, with branches nearly as long. Here, also, *Spiranthes autumnalis* occurs; *i. e.*, in almost all pastures, excepting those depastured by sheep.

ALEXANDER IRVINE.

October, 1853.

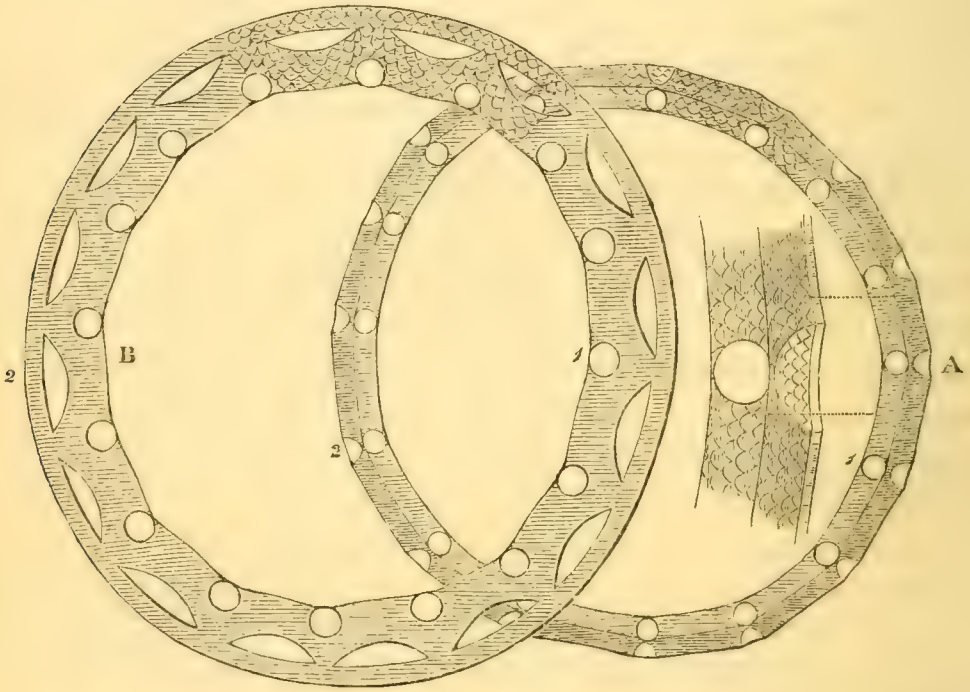
[We have taken the liberty to insert an editorial query, thus [?], after two or three names with which we are not familiar in their present form.—*Ed.*]

On the Contrast afforded by the internal Structure of the Stems of Equisetum limosum and E. fluviatile. By J. G. BAKER, Esq.

SINCE sending my former observations upon the Equiseta, I have been favoured with an illustrated report of a carefully conducted microscopical investigation into the anatomical structure of these plants, kindly undertaken, for the purpose of confirming or disproving their distinctness as species, by R. Etheridge, Esq., Curator of the Bristol Institution.

I am sending herewith, for publication, the drawings supplied by that gentlemen, so that the means of forming a decision respecting this question will be equally open to all; and further comment than a brief abstract of his notes upon the leading points of contrast will be rendered superfluous.

In both of the supposed species, the stem consists of a hollow tube, the central cavity of which many times exceeds in diameter the solid portion; in which respect they differ conspicuously from all the other species. The siliceous cuticle in both is identical: in the exposed portions of each it is equally penetrated by stomata, which are necessarily absent from its submerged parts. The solid portion of the stem in both consists of regular, well-defined, hexagonal cells.



A.—Transverse section of the stem of *E. limosum*, magnified. 1. Hollow tubes; 2. Triangular system of delicate hexagonal cells.

B.—Transverse section of the stem of *E. fluviatile*, magnified as in A. 1. Inner row of circular tubes; 2. Outer row of plano-convex tubes.

In *E. fluviatile* it is about twice as thick as in *E. limosum*, and is penetrated by *two* series of tubes, equalling in number the external striae. The inner row of these, which apparently contain the delicate spiral vessels and annular ducts, are circular in shape, and placed close to the central cavity. Behind these, but at a considerable space from the epidermis, alternate the second row of tubes, which are plano-convex or elliptical in shape; the major axis being double the length of the minor.

The solid portion of the stem of *E. limosum* is only about half as thick as that of *E. fluviatile*, and is consequently much less succulent. It is penetrated by only a *single* row of tubes, which, in their organization and position, resemble the inner row in *E. fluviatile*. The epidermis opposite these is depressed, and bears a system of

hexagonal cells, much more delicate in their texture than the surrounding tissue. This body of cells is invariably somewhat triangular in shape, the apex of the triangle being placed against the hollow tube. These differences will be more clearly perceived by the aid of the accompanying figures.

JOHN G. BAKER.

Thirsk, August 11, 1853.

Note on Pyrola rotundifolia, var. arenaria.

By D. OLIVER, JUN., Esq., F.L.S.

IN a recent number of the 'Annales des Sciences,' there occurs a note on *Pyrola rotundifolia*, var. *arenaria* of Koch, by Planchon; a notice or abstract of which, I think, may interest those British botanists who have not had the opportunity of reading the original. I subjoin the substance of a translation, which I trust may sufficiently convey its sense. I may add, that I do not myself possess examples of this maritime *Pyrola* from either Lancashire or Yorkshire; but an imperfect specimen, gathered a few years ago, near Castle Eden, Durham, from its several bracteal leaves, intermediate between the ordinary leaves and floral bracts, probably approaches, if it do not belong to, the form *arenaria*.

About six or seven years ago, Sir W. J. Hooker received from some correspondent a *Pyrola*, gathered on the Yorkshire coast, and since found on the shores of Lancashire by Kenyon (see Bab. Man. 2nd ed.) An examination of very numerous fresh specimens, and a careful comparison of these with the *Pyrola rotundifolia* of Europe and N. America, discovered several deviations from the latter type. Their smaller proportions; the less and more shortly petiolate leaves; their flowers but about half the size; the shorter calycine segments, sometimes approaching an oval instead of a linear outline; but more especially the numerous bracts *upon the stem*, in this plant always numbering four, five, or six of these organs, while in *P. rotundifolia* but two bracts are normal; remove the Yorkshire *Pyrola* from the type *rotundifolia*. Although this latter character was not expressly noted by Koch (Syn. Fl. Germ.) of the variety of round-leaved *Pyrola* which he called *arenaria*, yet the agreement of other structural points led him (Dr. P.), from the first, to presume the identity of the English plant with that of the German Flora.

This latter plant, however, remained unknown, excepting by a brief diagnosis, until Buchinger communicated to the herbarium of Loyer Villemet well-authenticated examples of this plant, gathered by Bœckler, in Norderney. A comparison of these specimens with those of our Yorkshire *Pyrola*, abundantly confirmed the previously presumed identity of the two; but it has at the same time, he says, modified his ideas as to the specific value of each of them, in proving to us that the unusual number of bracts, always constant in the English plant, is sometimes reduced to two, as in the normal type. This proved, the type *rotundifolia* seems, from actual observation, sufficient to include as a variety this form *arenaria*, which Planchon has long regarded as a species.

The object of this notice was merely to direct the attention of botanists to a remarkable form, which will be found, no doubt, on various shores of temperate Europe. Moreover, it is desirable carefully to follow through its possible variations a species which we find not only over Europe, but also in Siberia, and even, it may be, in the pine-forests of Mexico.

In conclusion, he adds that the *P. rotundifolia* of Gouan (*Flora Monsp.*), which grows in the Cevennes, with *P. secunda*, *P. minor*, and *P. uniflora*, is no other than the *P. chlorantha* of Swartz,—an opinion already established by the authors of the ‘*Nouvelle Flore de France*,’ but without any mention of Gouan’s synonyme.

DANIEL OLIVER, JUN.

Newcastle, October 10, 1853.

NOTICES OF NEW BOOKS, &c.

‘*Terra Lindisfarnensis. The Natural History of the Eastern Borders.*’ By GEORGE JOHNSTON, M.D. Edin.; LL.D. of Marischal College, Aberdeen; Fellow of the Royal College of Surgeons of Edinburgh; &c. Vol. I. The Botany. London: Van Voorst. 1853. Price 10s. 6d.’

(Concluded from page 1090).

Gardiner, ‘*Flora of Forfarshire*,’ p. 44, and several of our Scottish correspondents, appear to confound the furze and the broom, as far

as the celebrated and somewhat hackneyed anecdote of Linnean worship is concerned. Gardiner tells us that one of the dearest associations awakened in the mind by beholding the broom in flower, "is the remembrance that the gorgeous luxuriance of its golden blossoms so enraptured the illustrious Linneus when he first beheld it in profusion on his first visit to England, that he fell down upon his knees in an ecstasy of pleasure to enjoy such a glorious sight." The anecdote applies to the furze, and the delight of Linneus was occasioned by the beauty of the plant, amid the inclement eastern blasts of early spring, and would not apply to the broom, which flowers so much later. Dr. Johnston omits the story altogether, and gives us information about the broom far more acceptable.

"*Spartium scoparium* = *Sarothamnus scoparius*. The Broom. May, June. There are several places in Berwickshire the names of which indicate the former prevalence of this beautiful shrub in their localities; *e. g.*, Broomhouses, Broomilaw, Broomhill, Broomdykes, and Broomknowes;—but its habitat of greatest celebrity is Cowdenknowes, an undulatory rising ground of great beauty in the West of the county:—

‘ More pleasant far to me the broom
So fair on Cowdenknowes,
For sure so sweet, so soft a bloom,
Elsewhere there never grows.’

The progress of agriculture has greatly thinned and depauperated our broomie shaws, but still the ‘lang yellow broom’ is plentiful enough in many of our deans, and on many a steep brae, in upland districts especially. It is, says Sir Thomas Dick Lauder, ‘a curious fact in regard to the history of the plant, that it grows to perfection in a very few years, some seven or eight, we believe, and then dies entirely away, and then some years must generally elapse before the seed, with which the ground must necessarily have been filled, will vegetate: of this we have ourselves had large experience.’ ‘Tait’s Magazine,’ Oct. 1847, p. 657.—Sheep are very fond of the broom, and they may be pastured upon it and whins, in favourable situations, during winter, as an intelligent farmer, on the border of the Lammermuirs, informed me, he had often done with profit and advantage. The sheep invariably first pick off, and greedily devour, the pods, which produce a sort of intoxication, but this effect is transient, and leaves no inconvenience behind. ‘*Spartium scoparium si ovis ingurgitet, statim temulenta evadit, decumbit, et pro tempore ambulare nequit. Hæc affectio autem usui continuo plantæ cedit.*’ Rev. Dr. Walker.

It exerts a like intoxicating influence on man, and hence Allan Ramsey, in his address to a landlady who was famous for brewing a heady ale, tells us—

‘Some said it was the pith of broom
That she stow’d in her masking loom,
Which in our heads rais’d sic a soom ;
Or some wild seed,
Which aft the chaping stoup did toom,
But fill’d our head.’—*Poems*, i. p. 219.

An infusion or decoction of the young shoots is a popular, and not inefficient remedy in many dropsical cases. Besoms are called in the North, brooms, having, until of late years, been commonly made of the twigs of this shrub. In 1554, before the Bailiff’s court, a jury of twelve men found ‘that the yonge brome of this towne (Berwick) ought not to be cut, for it is a comodyte to this towne.’”—P. 51.

The observations which follow, respecting *Pyrola minor*, are singularly corroborated by some of our own on the appearance and disappearance of this species under the shade of fir-trees in woods in Herefordshire. The firs are always artificially introduced ; and it is not until these have arrived at mature age, towering above the surrounding forestry, and have destroyed the undergrowth of dwarf herbs, that the *Pyrola* makes its appearance. It will then suddenly cover a patch of many square yards, only, however, to disappear in the course of a few years, and display its peculiar leaves in a similar, but distant locality.

“*Pyrola minor*. Woods, B. In a wood at Orange Lane, and in a plantation to the north of Loch Lithtillum, Dr. R. D. Thomson. Blackadder plantations ; plantations at Greenburn ; in woods at Manderston House. Banks of the Dye above Longformacus. In a wood between the farms of Simprin and Swinton Hill ; and in a wood on the farm of Milne-Graden, J. Hardy. In almost every fir plantation in the west of Berwickshire, and in Roxburghshire, Dr. F. Douglas. —Mr. Hardy remarks that *P. media* flowers in greatest beauty when under long heather ; and I have observed of *P. minor*, that, when grown in a pot, the leaf-stalks twist and contort themselves so as to reverse the natural position of the leaf, and make the upper surface look to the ground, in a manner which appears to me remarkable.

“The circumstances that determine the appearance of this plant in our fir plantations are not well ascertained. It springs up in green patches after the baneful shade of the trees has extirpated the aboriginal possessors of the soil, such as the heaths and smaller *Carices*.

In this respect it resembles exactly the *Linnea borealis*. Whence have their seeds come? Have they lain buried and dormant in the soil since the ante-Roman period, when all this part of the country was covered with a forest? I think it not improbable. They were the fair flowers that were weeded away with the destruction and abolition of the shelter and shade that fostered their growth; and that shade being restored, they again revive and occupy their ancient haunts. They are peculiarly wild plants, and dislike civilization; and when we get amongst them, we feel as if the spirit was freed from bondage, and might be left safely to take its flight and freaks, 'playing with words and idle similes.'—P. 139.

The familiar foxglove has the following illustrative passage:—

"*Foxglove*. Often very ornamental in deans, and on rocky ledges that overhang the deep pools of our brattling burns:—

'I've lingered oft by rocky dells
Where streamlets wind with murmuring din,
And marked the Foxglove's purple bells,
Hang nodding o'er the dimpled lin.'

This plant is one of the wonderful ingredients used as 'bath' for sheep, but some shepherds object to its use, for they say that it blackens the wool very much. The leaves afford a medicine of great energy and value; and before this was known to physicians the foxglove or fox-tree was frequently administered by the bold country quack, not always with impunity. See Dalyell's 'Darker Superstitions,' p. 113.—About Greenlaw the plant from its stateliness bears the elegant name of the *King's elwand*:—

'Straight as the Foxglove, ere her bells disclose.'

The flowers were once applied to the purpose of caps by the troops of fairies that did inhabit our deans and sylvan retreats; now our little girls glove their fingers with them, putting them on the top of each other in a pyramid to overflowing, and they call them *ladies' thimbles*. Boys inflate them by blowing into the bell, then they crack them by a smart stroke. They also suck the honey at the base of the flower. Tempted by this nectar, the bee enters deep within the corolla, where, becoming imprisoned, it buzzes about with vexation and rage.

"The foxglove, pronounced to be 'the most stately and beautiful of our herbaceous plants,' could not, of course, escape the eye of Wordsworth; and he has given in the 'Prelude' to 'Retrospect,' p. 223, a correct enough portrait of the plant in its last stage, or old age:—

‘Through quaint obliquities I might pursue
 These cravings ; when the Foxglove, one by one
 Upwards through every stage of the tall stem
 Had shed beside the public way its bells,
 And stood of all dismantled, save the last,
 Left at the tapering ladder’s top, that seemed
 To bend, as doth a slender blade of grass,
 Tipp’d with a rain drop. Fancy loved to seat,
 Beneath the plant despoiled, but crested still
 With this last relic soon itself to fall,
 Some vagrant mother, whose arch little ones
 All unconcern’d by her dejected plight,
 Laugh’d as with rival eagerness their hands
 Gather’d the purple cups that round them lay
 Strewing the turf’s green slope.’

—P. 157.

“*Primula vulgaris*. Many botanists have their favourite flowers around which they associate certain events, feelings and facts, that perchance may be too deep for tears, and which it is good to muse in solitude and silence ; but singularly enough, few have thus married the primrose. It is, however, the favourite flower of my excellent friends Mr. Archibald Hepburn and the Rev. Dr. Landsborough.

“The favourite flower of

Sir J. E. Smith, M.D., was	<i>Geum rivale</i> .
Patrick Neill, LL.D.....	<i>Ranunculus Ficaria</i> .
Rev. Charles Abbot	<i>Alchemilla vulgaris</i> .
Professor Robert Graham, M.D.	<i>Sonchus alpinus</i> .
William Withering, M.D.....	<i>Menyanthes trifoliata</i> .
Rev. Dr. Chalmers	<i>Galanthus nivalis</i> .
Rev. William Kirby	<i>Geranium pratense</i> .
William Bromfield, M.D.....	<i>Tamus communis</i> .
William Borrer, Esq., is	<i>Primula farinosa</i> .
Professor J. H. Balfour, M.D....	<i>Astragalus alpinus</i> .
Professor G. W. Arnott, LL.D.	<i>Anagallis tenella</i> .
Robert K. Greville, LL.D.	<i>Saxifraga oppositifolia</i> .
Miss Attwood	<i>Campanula hederifolia</i> .
H. C. Watson, Esq.	<i>Trientalis europæa</i> .
The Author	<i>Oxalis acetosella</i> .”

—P. 165.

The idea of connecting a flower with the name of a botanist is pretty and poetical ; but the lament that *few have thus married the primrose*

is rather curious. Surely the chaste and delicate primrose would not desire more than one bridegroom. But if the botanical suitors of the "love-listening primrose" be few, her poetical ones are many, and none more sincere than the patriotic Elliott:—

" TO THE PRIMROSE.

" Surely that man is pure in thought and deed,
 Whom spirits teach in breeze-born melodies ;
 For he finds tongues in every flower and weed,
 And admonitions in mute harmonies.

Erect he moves, by Truth and Beauty led,
 And climbs his throne, for such a monarch meet,
 To gaze on valleys, that, around him spread,
 Carpet the hall of heaven beneath his feet.

How like a trumpet under all the skies,
 Blown to convene all forms that love his beams,
 Light speaks in splendour to the poet's eyes,
 O'er dizzy rocks, and woods, and headlong streams !

How like the voice of woman, when she sings
 To her belov'd, of love and constancy,
 Thy vernal odours, o'er the murmurings
 Of distant waters pour their melody

Into his soul, mix'd with the throstle's song
 And the wren's twitter ! Welcome then again,
 Love-listening Primrose ! Though not parted long,
 We meet, like lovers, after years of pain ;

Oh, thou bring'st blissful childhood back to me !
 Thou still art loveliest in the lonest place ;
 Still, as of old, day glows with love for thee,
 And reads our heavenly Father in thy face.

Surely thy thoughts are humble and devout,
 Flower of the pensive gold ! for why should Heaven
 Deny to thee his noblest boon of thought,
 If to earth's demigods 'tis vainly given ?

Answer me, sinless sister ! Thou hast speech,
 Though silent. Fragrance is thy eloquence,
 Beauty thy language ; and thy smile might teach
 Ungrateful man to pardon Providence."

The occurrence of the name of *Plantago lanceolata* leads us to mention a plant that occurs in Herefordshire. There are scarcely two species of plants more familiar to the English botanist than *P. media* and *P. lanceolata*. The first has ovate, the last lanceolate, leaves ; the first has long stamens, with beautifully purple filaments, giving

the flower a very attractive appearance ; the last has short stamens, with dingy filaments, and a very common-place appearance. The Herefordshire plant has the ovate leaves of *media*, and the unattractive inflorescence of *lanceolata* ; both which species abound in the same neighbourhood. This record is merely episodal : may it induce a competent botanist to investigate the subject.

“ *Plantago lanceolata*. Rib Grass : Kemps. Common in meadows and pastures. June.—Sown with other ‘artificial grasses,’ and eaten with great avidity by all sorts of cattle.—It is customary with children to challenge each other to try the ‘Kemps.’ A kemp consists of the stalk and the head or spike. Of these an equal number is skilfully selected by the opposed parties ; then one is held out to be struck at with one from the opponent’s parcel, which is thrown aside if decapitated, but if not, is used to give a stroke in return. Thus with alternate strokes given and received, the boys proceed until all the Kemps but one are beheaded, and he who has the entire Kemp considers himself the victor. Kemp is synonymous with hero or champion. But the practice has also given to the plant the name of *Fightee-Cocks* amongst the children in Berwick and its vicinity ; and in Durham *Cock-fighters*.

“ It was once, and perhaps still is, a custom in Berwickshire to practise divination by means of Kemps. Two spikes were taken in full bloom ; and being bereft of every appearance of blow, they were wrapt in a dock-leaf and put below a stone. One of them represented the lad, the other the lass. They were examined next morning, and if both spikes appeared in blossom, then there was to be ‘aye love between them twae ;’ if none, the ‘course of true love’ was not ‘to run smooth.’ The appeal, however, generally ended as the parties wished, for, since it is the rule, in the inflorescence of spikes, that the florets blow in succession, the being laid beneath a stone would have little influence in retarding the normal expansion of them, if ready for development. The same, or a similar, superstition prevails in some parts of England : thus Clare in his ‘Shepherd’s Calendar :’—

‘ Now young girls whisper things of love,
And from the old dame’s hearing move ;
Oft making “ love-knots ” in the shade,
Of blue-green oat or wheaten blade :
Or, trying simple charms and spells
Which rural superstition tells,
They pull the little blossom threads,
From out the knot-weed’s button heads,

And put the husk, with many a smile,
 In their white bosoms for a while,—
 Then if they guess aright the swain,
 Their loves' sweet fancies try to gain :
 'Tis said, that ere it lies an hour,
 'Twill blossom with a second flower,
 And from the bosom's handkerchief
 Bloom as it ne'er had lost a leaf.'"

—P. 170.

In the note which follows, on *Orchis latifolia*, we think there is some little mistake in the application of the provincial names. The terms "Deil's-foot" and "Dead-men's-fingers" will do very well for this species, and for *O. maculata*, to which, indeed, the latter term is generally applied; but the term "Adam and Eve" is confined to *O. mascula*, or, at least, to the group having undivided tubers.

"*Orchis latifolia*. Cocks-Kames. Common in boggy ground, and not easily to be distinguished from the preceding. The root, from its shape, is sometimes called the *Deil's-foot*, and sometimes *Dead-men's-fingers*; but it is more generally known as *Adam and Eve*,—the tuber which sinks being *Adam*, and that which swims being *Eve*. *Cain and Abel* is another name for these tubers, Cain being the heavy one. They are, or sometimes were, used as love-charms. If a woman wished to secure the affection of any young man on whom her heart was set, she put, unseen, one of the tubers into the pocket of his dress, and thus he became so enchanted that he must follow the intriguer wherever she went! This is the very property that Shakespere ascribes to his Love-in-Idleness."—P. 193.

The following paragraph is replete with poetry and beauty. It may be urged that it has little to do with *Poa fluitans*; but, to us, that is no objection: we love the mind that draws a pleasing simile from such a source,—that perceives a cause for hopeful rejoicing in that which is, for the time being, veiled in obscurity, or oppressed by circumstances; in fact, we love the mind that sees "good in everything."

"*Glyceria fluitans*. Marshy spots in old meadows get very green and fresh in winter, and catch the pleased eye afar off. This is not from contrast with the surrounding barrenness, but from the vegetation of the perennial grasses that occupy a wet soil. Sandy links, on the contrary, are dull and dead, and rough with the persistent stalks of their wiry bents. The tufts of rushes, which stud the wet green meadow, continue to preserve their living colour about the base and half-way up the stalks, but the tops have become dry and withered. A deeper green heightens the effect of the various kinds of

pine, and renders their planting less gloomy in the prospect: but deciduous trees get a settled brown, with, however, red and pleasant tints, from the buds covered up in their varnished scales; and I have noticed that, in the distance, these brown woods are silvered over as with the gray hue of age. It is when in this naked condition that the naturalist studies to advantage the character of the various trees in their mode of ramification; and I remark that the branchlets of the ash and plane are opposite, patent and knobby; those of the elms alternate, zigzag and flabellate; of the oak irregular, kneed, and spreading; and of the willow irregular and erect, but so lithe as almost to droop. The slender twigs of the birch are more decidedly pendulous, and woven almost into an irregular trellis; while those of the beech are regularly alternate and patent.—These are trivial observations? Not so to one of my capacity and tastes: they gave interest to my walk, and that had its value; and, perhaps, I may have read, in this unadorned page of my Book, the lesson that there was a good design, in all the unregulated variety before me, to please and comfort even the sensual eye. The eye, salved with euphrasy and rue, might have seen other lessons which I may not decipher to the full, yet even I could see, in the far distance, Spring and Summer hastening onwards to reclothe the skeletons, apparently so dead to every sweet influence, with green leaves and smiling flowers; and Autumn give the promise of abundant fruits. Is there no lesson in the vision? Many:—and one suits my present humour, which I give in the words to which it was set by a poet two centuries ago:—

‘ I know you would not love, to please your sense
 A tree, that bears a ragged unleaved top
 In depth of winter, may when summer comes
 Speak by his fruit he is not dead but youthful,
 Though once he showed no sap; my heart’s a plant
 Kept down by colder thoughts and doubtful fears.
 Some frowns like winter storms make it seem dead,
 But yet it is not so: make it but yours,
 And you shall see it spring, and shoot forth leaves
 Worthy your age, and the oppressed sap
 Ascend to every part to make it green,
 And pay your love with fruit when harvest comes.’ ”

‘ *Some Notes upon the Cryptogamic Portion of the Plants collected in Portugal, 1842—50.* By Dr. FRIED. WELWITSCH; the Fungi by the REV. M. J. BERKELEY, M.A., F.L.S., &c., &c., &c. London: William Pamplin, 45, Frith Street, Soho Square. 1853.’

This little *brochure* is printed for the use of the subscribers to the collections of Portuguese plants made by Dr. Welwitsch. It contains a list of seventy-three species of Fungi; each species being accompanied by a note as to the habitat, plant on which it is parasitic, &c. Twelve of the species are new to science, and we have therefore extracted their characters, thinking they would be useful to the cryptogamic botanists of this country.

“ *Phyllosticta hæmatocycla*, Welw. No. 4. Maculis latissimis pallidis rufo-cinctis; peritheciis parvis submarginalibus; sporis oblongo subclavatis; sporophoris amplis. On the leaves of *Phormium tenax*; Lisbon, Jan. 1843. *Obs.*—Spots irregular, several inches long, occupying almost the whole breadth of the leaf, surrounded by a rich rufous toothed or entire border. Perithecia rare, mostly marginal. Spores hyaline oblongo-subclavate. Sporophores clavate.

“ *Dothidea durissima*. Pustulis elevatis compactis; ostioli cellularum exasperatis; sporidiis fusiformibus uni-triseptatis. Welw. No. 12. On branches of *Quercus pseudococcifer*, Webb; near Piedale, on the left bank of the Tagus. *Obs.*—Pustules raised very hard and compact about a line broad, rough with the prominent ostiola. Asci clavate; sporidia fusiform, at first uniseptate, but eventually a septum is formed in either of the divisions; each endochrome contains a large nucleus. I have seen only two sporidia in each ascus.

“ *Gymnosporium inquinans*. Soris elongatis aterrimis; sporis lævibus obscuris ovatis vel subellipticis. Welw. No. 20. On dead stems of *Arundo Donax*, near Lumiar. *Obs.*—Forming linear elongated at length confluent sori, consisting of dark even ovate or subelliptic spores, which spring from short, sometimes forked threads. This species is common, but I believe it is undescribed.

“ *Phyllosticta Ceratoniae*. Maculis nigro limitatis irregularibus; sporis minutis anguste ellipticis hyalinis. Welw. No. 37. On leaves of *Ceratonia siliqua*, in the Serra of Arrabida. *Obs.*—Spots very irregular, often marginal, surrounded by a raised dark line, gray or dusky. Spores minute elliptic narrow hyaline.

"*Perisporium nitidulum*. Nitidum nigrum in maculas congregatum; peritheciis minutis hemisphericis; sporidiis subglobosis minutis fuscis. Welw. No. 38. On dead leaves of *Agave Americana* with *Nectria sanguinea*, *Sphæria herbarum*, &c., near Situbal. Forming little black patches consisting of numerous shining black hemispherical minute perithecia. Sporidia minute subglobose or broadly subcymbiform. I have not seen asci, but in several species these are very soon absorbed and the habit is that of *Perisporium*.

"*Phoma Erythrinæ*. Peritheciis ostiolisque prominulis; sporis oblongo linearibus hyalinis. Welw. No. 46. On dead branches of *Erythrina Crista Galli*; Lumiar and elsewhere near Lisbon; mixed with *Sphæropsis crassipes*, scattered. Perithecia prominent raising the epidermis which remains unaltered and piercing it by a rather prominent ostiolum. Spores linear, oblong, one three thousandth of an inch long, one sixth as much thick, sporophores about twice as long delicate.

"*Sphæropsis crassipes*, Mont. MSS. Gregaria epidermide tecta; maculis perithecorum irregularibus atris centro albis; sporis oblongis; sporophoris subrobustis. Welw. No. 46. On dead branches of *Erythrina Crista Galli*; Lumiar. The perithecia occur in irregular patches extending several inches. The cuticle above each perithecium is of a shining black, but white in the centre. Sporophores nearly twice as long as the spores, rather stout; spores oblong, subelliptic, one seventeen hundred and fiftieth of an inch long.

"*Septoria brunneola*, Berk. Peritheciis epidermide brunneo tectis; sporophoris rectis; sporis sursum curvatis filiformibus dimidio brevioribus. Welw. No. 46. On dead branches of *Erythrina Crista Galli*, sparingly; mixed with *Sphæropsis crassipes*, Mont. Perithecia scattered or arranged two or three together in a line covered with the cuticle, which is raised just above them, and of a dull brown. Spores filiform, curved, about one eight hundred and seventy fifth of an inch long, about twice as long as the filiform straight sporophores.

"*Valsa Welwitschii*. Pustulis parvis circumscriptis; stromate pallido; peritheciis globosis immersis albofartis, collis longiusculis; ostiolis convexis subpunctiformibus; ascis tenellis; sporidiis curvulis. Welw. No. 47. On the smooth bark of elms; Cintra. Pustules scarcely one third of a line broad, elevating the bark; disk narrow; stroma pale; perithecia globose immersed about five in each pustule, sometimes however solitary, neck rather long; ostiola convex subpunctiform; asci short, very delicate, sporidia eight minute oblong curved.

“*Depazea crepidophora*, Mont. MSS. Maculis orbicularibus fuscis sero griseis fusco limitatis; peritheciis minimis; ascis crepidiformibus minutis; sporidiis oblongis uniseptatis. Welw. No. 51. On living leaves of *Viburnum Tinus*, near Caldas da Rainha, August, 1850. *Obs.*—I have not been so fortunate as to find perfect fruit in this species, and I therefore describe it from a sketch by Dr. Montagne.

“*Septoria Pisi*. Maculis parvis orbicularibus; sporis filiformibus breviusculis robustioribus. Welw. No. 64. On leaves of *Pisum sativum*, in fields near Ajuda, March. Distinguished by its more robust and shorter spores.

“*Phoma Cacti*. Maculis suborbicularibus l. effusis; peritheciis majoribus prominulis; sporis minutis oblongo ellipticis; sporophoris filiformibus. Welw. No. 72. On dead *Cactus peruvianus*; Lumiar. *Obs.*—Bursting through the cuticle and having the aspect of a minute *Diplodia*.”

‘*The London Catalogue of British Plants. Published under the direction of the Botanical Society of London. Adapted for marking Desiderata in Exchanges of Specimens, &c.* Fourth Edition. London: William Pamplin, 45, Frith Street, Soho. 1853. Price 6d.’

The issue of a fourth edition of this Catalogue affords irrefragable evidence of the progress of British Botany, and of the success of that Society whence it emanates. The prominent characteristic of the Botanical Society of London is the exchange and dissemination of well-named specimens; and in this it has fairly distanced every competitor. Indeed, so decidedly is this the case, that, numerous as are the notices and advertisements which have reached us, we scarcely know whether any of the competing Societies have outlived their announcement, whether they still exist, or still aim at carrying out their views according to their own programme. Perhaps we cannot do the botanists of this country a better service than recording, we might say reiterating, the conditions under which the distribution of specimens is carried out.

“The Botanical Society of London is a central institution for effecting exchanges of Specimens between Members of the Society in any part of Britain; also, for exchanges with Foreign Botanists, who are not required to become members in order to obtain the same privilege.

“Members send their spare duplicates to the central dépôt in

London, and are entitled to claim, in return, such British or Foreign species as the Society's store of duplicates may afford. A preference in the supply of their desiderata is given to those contributors who most exactly conform to the subjoined Regulations.

“The Annual Subscription entitles any member to claim fifty species, without the obligation of contributing specimens to the store; priority still being given to the claims of actual contributors in selecting desiderata.

“*Desiderata of Members.*—These can be applied for by prefixing short horizontal marks (—) to the names of the desiderated species or varieties in a copy of the ‘London Catalogue of British Plants,’ published for this purpose by the Society. If a manuscript list be sent instead, it must correspond exactly with the printed Catalogue, latest edition, in the names and prefixed numbers or letters, and also in their order of sequence.

“*Desiderata of the Society.*—Lists of desiderata will be sent to the contributing members annually. To prevent the accumulation of useless specimens, and to avoid the needless destruction of rare plants, contributors are requested to send only the species asked for by the Society. An exception to this rule may properly be made in the case of newly discovered species not yet entered in the Catalogue, or of any remarkable varieties not included therein.

“*Time of sending Parcels.*—This is optional with the contributor; a return parcel being made up as soon as practicable after the receipt of one from him. But the best return can be made for parcels received near the end of the year; and it is also most convenient to the Society that parcels should arrive in December;—least convenient, between December and April.

“*Number of Specimens.*—In a parcel of British plants, it is generally more convenient to the Society that there should be only few species (say, one to ten species) and many duplicates (say, ten to a hundred specimens, according to rarity), of each species.

“*Character of Specimens.*—The specimens should be such as to show clearly the distinctive characters of the species, and be otherwise as perfect examples of it as possible. Small plants should be sent entire, roots included. Long plants should be bent or folded before drying. No fragments ought to be sent, unless those of trees or other large and branching plants which cannot be folded within suitable dimensions if entire. Unsuitable specimens are destroyed, and unprofitably waste the time of the distributors in separating and removing them.

“ *Size of Specimens.*—The Society’s paper for duplicates is seventeen inches in length. Specimens should be two inches shorter than the paper, in order to lessen the risk of breakage, consequent on repeatedly turning over the duplicates while selecting desiderata.

“ *Preservation of Specimens.*—The specimens are to be pressed in porous paper, sufficient in quantity to dry them rapidly, and thus to preserve their colour; and to be placed under a pressure sufficiently heavy to keep their leaves from becoming wrinkled, and consequently too brittle when dry.

“ *Labels.*—All British specimens are to be sent ready labelled by their contributors. The labels are to be attached to the specimens, either by a slit at their base or otherwise, as convenient; care being taken that the name and number of the plant are never concealed or obscured by any part of the specimen lying across them. The labels are expected to show the following particulars:—1. The *No.* of the species, or *No.* and *Letter* of the variety, according to the ‘London Catalogue,’ placed at the upper left-hand corner of the label.—2. The name of the *Species* or *Variety*, from the same Catalogue, always with the addition of the authority after the name.—3. The name of the *County* in which the specimen was gathered; together with any more exact description of the locality which the contributor may think desirable.—4. The name of the *Contributor*, placed at the bottom of the label; that of the *Collector* also being added, if not the contributor himself.—5. The words ‘*Botanical Society of London*’ are not to be used on the labels of contributors unless by express authority from the distributors in London.

“ N.B. In the ‘London Catalogue’ the names of authorities are occasionally too much abbreviated, from want of space in the line.

“ *Attention to Regulations.*—Exact attention to the preceding regulations is earnestly entreated. Where specimens have to be examined, sorted, arranged, and re-distributed in many thousands annually, uniformity and exactness become matters of the utmost importance. It is impossible for distant members to know how greatly any deviations (such as may be fancied very trifling deviations from rule) will impede the routine of management in London, and thus very inconveniently increase the heavy duties of the distributors.”

PROCEEDINGS OF SOCIETIES, &c.

THE PHYTOLOGIST CLUB.

One Hundred and Fiftieth Sitting.—Saturday, October 22, 1853.

MR. NEWMAN, President, in the chair.

The President read the following communications :—

New Westmoreland Station for Woodsia Ilvensis.

“A new station for *Woodsia Ilvensis* has been found in Westmoreland. As it is many miles from the Teesdale habitat, I consider it an interesting and important discovery. It was found by Isaac Hudhart, a gardener, who has studied the ferns, and has been very successful in finding all the best ferns of this district. He has very wisely told no one about the locality of the *Woodsia* but myself; for I consider it absolutely necessary to keep secure the habitats of good ferns now, as, if known, they are sure to be exterminated. There may be about twenty plants. I enclose a frond, to enable you to verify my statement.”—*Frederic Clowes; Holly Hill, Windermere, September 14, 1853.*

The President observed, that the fronds kindly transmitted with this note are similar to those gathered on Falcon Clints.

Lastrea rigida near Bath.

“Observing in the last number of the ‘Phytologist’ (iv. 1101) that a solitary plant of *Lastrea rigida* had been found near Bath, by J. E. Vize, Esq., may I suggest the possibility, if not the probability, that it had been planted there by *Potter*, a well-known fern-collector, now dead, *en route* to Cheddar for *Polypodium calcareum*; having heard from his own mouth that he did so with other plants, in order to save their extermination.”—*G. B. Wollaston; Chiselhurst, Kent, October 5, 1853.*

Agrimonia odorata in Hampshire.

“I have much pleasure in announcing the discovery of *Agrimonia odorata*, *Miller*, in the northern part of Hampshire. I gathered it on the 13th of September, at Tucker’s-Hill Farm, in the parish of Kingsclere; and at Inhurst Farm, in the parish of Banghurst. In both places it was growing in considerable abundance; and, at the latter,

some of the specimens were five feet high. In all probability, it will be found plentifully throughout the country lying between the river Emborne and the Hampshire Downs.”—*W. Mathews, jun.*; *Edgbaston House, Birmingham, October 3, 1853.*

Filago spathulata near Woodstock.

“It may be worth while to record the occurrence of *Filago spathulata*, *Presl*, in the neighbourhood of Woodstock. I gathered it on the 11th instant, about half a mile from the town, where it grows abundantly, in waste places by the side of the Oxford road.”—*Id.*; *October 18.*

Lastrea Thelypteris in Warwickshire.

“Since the draining of the bog at Allesley (see *Mag. Nat. Hist.* vol. v. p. 199), I have had no reason to believe that *Lastrea Thelypteris* has ever been met with in Warwickshire. About three weeks ago, a few specimens of this fern were brought to me, for examination, by Mr. Henry Bromwich, gardener, of Myton. Last Tuesday (October 11), accompanied by Mr. Bromwich, I visited the locality, a swamp, indicated on the Ordnance Map by a faint nebulous mark, about four miles N.N.W. of Warwick, half a mile N. of Goodrest Lodge, and within a few yards of Rounsel Lane. We found this beautiful fern growing in great abundance, and of unusually large dimensions. The fronds were from two feet and a half to four feet high.”—*W. G. Perry*; *Warwick, October 17, 1853.*

Aceras Anthropophora, and Ferns with bifid and multifid Fronds, in Jersey.

“I found, the other day, at Rozel, a plant of the *Aceras Anthropophora*, in seed; so there is another plant to be added to Babington’s Catalogue. I have been shown specimens of the following ferns, with the extremity of the fronds bifid, and sometimes multifid, which have been gathered in the Island; *viz.*, *Asplenium Trichomanes*, *A. Adiantum-nigrum*, *A. lanceolatum*, *Blechnum boreale*, *Polypodium vulgare*, *Aspidium Filix-mas*, and *Scolopendrium vulgare*; but, I believe, this last is frequently found in that state. I have myself found a plant of *Aspidium angulare* in which some fronds were bifid and others multifid; and there was only one frond in the whole that was simple.”—*M. Piquet*, in a letter to N. B. Ward, Esq., who kindly communicates it.

Lathyrus latifolius near Glastonbury.

“I was lately shown the broad-leaved everlasting pea (*Lathyrus latifolius*) growing in a wood on Ivythorn Hill, near Glastonbury. My friend who showed it me had known it there for twenty years, or more; and it had the appearance of being perfectly wild; but it was confined to one spot; nor, after a search of two or three hours, could we find it anywhere else in the neighbourhood. We found, however, two other rare plants, growing not far from it, *Lithospermum purpureo-cæruleum* and *Astragalus glycyphyllos*. I enclose a pair of the leaflets of the *Lathyrus*, by which it will be seen that I have not mistaken a broad-leaved variety of *L. sylvestris* for it.”—*Thomas Clark; October, 1853.*

Trichomanes speciosum in Ireland.

Mr. Newman made the following observations:—“The old *saw* of ‘Eyes and no Eyes’ is often brought to my mind by the records of botanical tourists; and no species so frequently calls it to remembrance as *Trichomanes speciosum*. One writes that ‘the fern is extirpated from the Killarney district;’ a second, that it has ‘long ceased to exist at the old station at Turk Waterfall;’ a third, that it ‘exists in fifty stations all round Killarney;’ and a fourth, that it is ‘abundant and luxuriant, at the present moment, at Turk, and may be seen from one of the points to which tourists are taken to view the fall.’ The last account is verified by the transmission of specimens, and emanates from one whose word is not open to question.”

MALVERN NATURALISTS’ CLUB.

Meeting at Knightsford.

On Tuesday last, the 14th inst., the Malvern naturalists held their September field meeting, at Knightsford Bridge, where they were joined by a party from this city, and a deputation from the Worcester Club. The vicinity of Knightsford is not exceeded in picturesque beauty by any part of the county of Worcester; and many have been the pleasant parties here, as mine host of the cozy inn at the Bridge could bear witness. Here, too, in twilight times long gone by, several geological formations took a fancy to join company; and the “faults” they then committed are still commented upon by those

who, strange as it may seem, profess acumen sufficient to see through a stone wall ! But as, according to the dictum of the poet, there never was a faultless piece, so the slips of geology may be deemed but venial, since the level surface of the earth is thus modified, and a wilderness of beauty is formed out of a chaos of débris. Such is the case about Knightsford and Ankerdine ; and this country the lovers of Nature were now about to explore. After some preliminary business, under the Presidency of the Rev. W. S. Symonds, Rector of Pendock, the exploration commenced, under the direction of Mr. E. Lees, F.L.S., who had formerly the advantage of going over the same ground with Dr. Buckland. Rosebury Rock, on the southern bank of the Teme, was first visited ; and on the way to it a remarkable spot was examined : where the Silurian ridge, in its progress from Suckley, suddenly terminates, a great fault throws the new red sandstone unconformably against the old red ; and, a denuding or displacing force having at an early date swept away the divided Silurian beds, the Teme at present glides through a channel that originally admitted a current of the primæval sea. The verge of Rosebury Cliff, 378 feet in altitude by the trigonometrical survey, was now approached, and the word given to descend its almost perpendicular face, which was at length safely effected. As a picturesque object, Rosebury forms a beautifully wooded mass, shadowing the rapid Teme that bathes its base. In its cool, shadowy recesses *Scolopendrium*, *Polypodium*, and other ferns, grow much more luxuriantly than usual ; and it may be searched with advantage for mosses and the *Cryptogamia*. The rarer plants now gathered were *Cotyledon Umbilicus*, *Teesdalia nudicaulis* (very fine), *Potentilla argentea*, and *Campanula Trachelium*. Poetical wanderers may be interested in knowing that this rock was a favourite haunt of the fairies ; and in the lane near it is a large old maple-tree, called *Bate's Bush* : the said maple growing, as traditionally stated, from a stake driven through the body of a poor suicide ; and in connexion with which Mr. Allies, in his 'Antiquities and Folk-lore of Worcestershire,' has recorded a most horrible tale of "something like a black pig," and "a man without a head," seen there by credible observers, of course at the witching hour of night !

The declining autumnal season lessened the number of plants generally gathered by the botanists of the party ; but it may be noticed as a pretty feature that the crest of the hill was purple with the flowery ling (*Calluna vulgaris*) ; while the bushes on the margin of the woods were prettily wreathed with the virgin's bower (*Clematis*

Vitalba), almost the last blossom of the year that falls from Flora's lap. The orpine (*Sedum Telephium*) was also gathered, in flower, upon Ankerdine, and quantities of the pretty eyebright (*Euphrasia officinalis*) decorated the grassy slopes. A very singular vegetable appearance attracted every eye near Collins' Green, and caused all to mount up the bank, to examine it. A dwarf oak, growing on a prominence not far from the road, appeared to be covered with ruby-glowing fruit, of the size of grapes; indeed, delicious in aspect as the bunches depending from the most luxuriant vine. They were found to be a most astonishing growth of *gall-nuts*, that in maturity very much simulate the appearance of a ripe strawberry; but such a quantity as here appeared were surely never before seen! The boughs of the oak were literally bent down with their clusters, some of the leaves having as many as twenty large gall-nuts upon them, and numbers had from four to ten; altogether the tree must have borne thousands. These gall-nuts arise from the puncture of a small hymenopterous insect, called *Cynips quercifolia*; and the liquor deposited has the effect of inducing the tissue of the leaf to be thus metamorphosed into apparent fruit, which really nourish a young grub within each of them. These pretty-looking galls, being tasted, were pronounced "bitter as soot," and as belonging to the Unedo family, only fit to be once eaten! In fact, they are strikingly analogous to the celebrated apples of Sodom, which are proved to have been galls of a larger kind, and which were so tempting to look upon, but crumbled into bitter ashes when any one attempted to eat them. They were reported to grow on the shores of the Dead Sea; and Milton appropriately introduces them into Pandemonium, as a dessert for the "thrones and dominations" he places there. The galls formed by the Cynipidæ take various forms; and the little, flat, brown disks, often seen on the under side of oak-leaves in autumn, are of the same nature, though commonly regarded as small Fungi.

From the deceptive, simulating fruit-tree, specimens of which were carried off, the party took the route for Berrow Hill, whence they returned by way of Horsham and the copses along the Temc-side; and a pleasant walk through orchards and meadows brought them back to Knightsford. In this last part of the route were gathered *Jasione montana*, *Picris hieracioides* (plentiful), *Inula Conyza*, and many species of *Rubi*, now blackening the hedges with their fruit; *Rubus tenui-armatus* more particularly noticeable. Also, among Fungi, the blood-coloured *Boletus scaber*.

The labour of observation being at last ended, none were found

missing from the abundant spread which mine host of the 'Talbot' had provided, and which was duly honoured in the attack and destruction thereof. But philosophers only eat and drink to live, and soon get again to their mental enjoyments. After a loyal toast or two, the Rev. F. Dyson, V.P., said, that as their labours in the field would be soon ended, they had still resolved that they would try, even within doors, to extend the love of their favourite study; and thought that a short course of lectures, delivered at Malvern, where there seemed a desire to embrace such an opportunity, would have a good effect. The Vicar of Malvern had, in the most kindly spirit, offered them the use of the Lyttelton school-room; and they could thus have a monthly lecture through the autumn and winter. The President said he could promise them the aid of Professor Buckman on Geology; but his idea was to commence with Field Botany, before all the flowers were gone; and he had induced his friend, Mr. Lees, to give them a subject they all knew he was so familiar with. He would, then, with their permission, take October the 13th for their inauguration day, and after some general opening remarks leave his friend to guide them into flowery paths, in his own peculiar way. Their worthy Secretary, Mr. Walter Burrow, would undertake the necessary arrangements; and they could have tickets from him. To make the matter still more pleasant, they intended a last meet for the season, the day after the lecture, which must, however, be at Eastnor, as a kind friend of his near Ledbury had authorised him to invite the Club to his hospitable board; and he trusted they would all respond to the invitation. A communication was then read from Mr. Baxter, of Worcester, as to his discovery of *Udora Canadensis*; and Mr. Lees, on the call of the President, entered into its history. The proceedings closed with a feeling and eloquent speech from the President, in reply to his health being given, and most warmly responded to. He said that their meetings were full of interest and delight, pleasant and beneficial to all of them. When he commenced the study of Natural History, he found the want of that friendly communion which would have much lessened his labours; but he had since enjoyed many associations like the present; and, independent of their higher mental influences, they had the advantage of bringing able and amiable observers together, who could confer on many points without ceremony; and thus they got occasionally in presence even with the heads of science, with whom otherwise they might never have been acquainted.

ROYAL PHYSICAL SOCIETY OF EDINBURGH.

Botanical Expedition to Oregon.

At one of the late meetings of this Society, Andrew Murray, Esq., W.S., read a paper 'On some Insects from the Rocky Mountains, received from the Botanical Expedition to Oregon, under Mr. Jeffrey,' which was prefaced by the following remarks :—

"Most of the members of this Society who are botanists and horticulturists are probably aware that an expedition to Oregon and the Rocky Mountains, for the purpose of procuring seeds and plants from that quarter, has, some time since, been organized, by an association of gentlemen interested in the arboriculture and horticulture of Scotland, and is at present in the course of being carried out. It will, perhaps, be interesting to those who have not heard of the association, if I give a brief notice of its origin and present position.

"I do not know who first introduced the plan of sending out collectors to different countries, to procure seeds and plants as a commercial speculation; but during the last half century it has been carried to a very considerable extent by our principal nurserymen, many of whom have fitted out expeditions at a large cost; by which means many very valuable plants have been introduced into this country. Other expeditions, of a like nature in all but their commercial object, have been sent out by private individuals or societies. The London Horticultural Society have sent out several collectors to different quarters; and it was the success of one of them which may be said to have given rise to this association. The one I allude to was that of Douglass to the river Columbia, where, the climate being much the same as our own, most of the plants he introduced have been found hardy, and have readily been naturalized. It was to him that we owe the *Abies Douglassii*, the *Ribes sanguinea*, or flowering currant, our most beautiful Pentstemons, and many other flowering plants. The success of this expedition, and the accounts received from Douglass and others of the magnificence and beauty of the pine-trees in that country, particularly struck Mr. Patton, of the Cairnies, in Perthshire,—a gentleman who has more peculiarly directed his attention to the pine tribe, and is at present engaged in a series of experiments on their cultivation, and suitableness for this climate, which will be doubly valuable, from their practical nature. It struck Mr. Patton that it might be possible to get a sufficient number of gentlemen to combine together to raise funds to send out a collector,

to more fully explore the country which had already proved so fruitful, and to send home from it, and from the neighbouring districts, seeds of new hardy trees, shrubs, and flowers. He communicated his idea to Professor Balfour, who, with his happy freedom from jealousy (a quality which is not always found among scientific men), at once not only approved and adopted the idea, but immediately gave his best energies to working it out. Two other gentlemen, well known in this city for the readiness with which they forward any scheme having for its object the public benefit (I mean Lord Murray and Sir William Gibson-Craig), principally aided in setting the scheme a-going. Through their kind offices, the protection of Government, and of the Hudson's Bay Company, were obtained. Other gentlemen, of whom I shall only mention Mr. M'Intosh, of Dalkeith, aided in procuring subscribers; and in a short time the Association found itself in a position to carry its objects into effect. The project was broached in November, 1849; and by the first fleet of the Hudson's Bay Company's ships which left this country after that, Mr. Jeffrey, a young and zealous botanist (who had been appointed collector), set sail for America. He arrived at York Factory in August, 1850, and at once pushed westwards, for the Rocky Mountains. He travelled with one of the Hudson's Bay Company's brigades, till they reached Cumberland House, where the brigade wintered. Mr. Jeffrey there found that he would lose a whole season if he remained till the brigade started in spring, and, with great energy, at once resolved to go on with what is called the winter packet. This packet starts from York Factory, in Hudson's Bay, in the month of December, and is carried by men, on their backs, from post to post, till it reaches the Rocky Mountains. Mr. Jeffrey started with this packet from Cumberland House, on the 3rd of January, 1851, and reached Jasper's House, on the Rocky Mountains, on the 21st of March. In one of his letters, he says:—'All this distance (1200 miles) I walked on snow-shoes; the snow being, on an average, two feet deep. During this journey I slept with no other covering than that found under the friendly pine, for the space of forty-seven nights; on several occasions the thermometer standing from 30° to 40° below zero.' Mr. Jeffrey was thus enabled to commence his labours in the spring of 1851; and a portion of the seeds he then collected was received last autumn, in fine condition. Among the seeds which have been received are those of several very interesting trees and plants. There is a beautiful new pine, which grows to the height of 150 feet, and has a circumference of 13½ feet at the base. This first-fruit has been rightly named *Abies*

Pattonii. There are also two Piceas, one of which (supposed to be *Picea lasiocarpa*) grows to the height of 250 feet; and the other (supposed to be new), to the height of 280 feet. We can hardly realize the idea of such stupendous trees; but it may help us to some notion of their height if I compare them with some familiar object here. The height of the brick stalk of the Gas Company's chimney, from the stone pedestal, is 264 feet (the pedestal is 65 feet); the top of that chimney is five feet higher than the top of Nelson's Monument; so that if we fancy a tree growing down in the valley between the Canongate and the Calton Hill, on an eminence the height of the pedestal, and overtopping Nelson's Monument by ten feet, we may form some notion of the monarchs of the forest which are now being introduced into this country."

THE PHYTOLOGIST CLUB.

One Hundred and Fifty-first Sitting.—Saturday, November 26, 1853.—MR. NEWMAN, President, in the chair.

The President read the following communications:—

Thymus Serpyllum and T. Chamædrys.

"I have, during the last ten years, paid much attention to the habits and physical difference of these plants, which are nearly allied to each other in appearance; and will give such descriptions as will enable the novice in Botany to detect them.

"The name of *Thymus Serpyllum* was formerly applied to both species, botanists considering them as one; but still *T. Serpyllum* may be significantly applied to one, which I will describe first. *Thymus Serpyllum* creeps and roots along the earth over a considerable space, and remains many years. It comes into bloom about the middle of June, has a slight smell of lemon, and tastes a little aromatic; which taste and smell, as also its stratal adaptation, which I would call the geology of plants,—a study most interesting to the botanist and agriculturist,—are essential to its discrimination. It prefers a very dry sandy soil on rocks, and in ditches and dry pasture-fields.

"*Thymus Chamædrys*, for it has obtained that name, comes into bloom about the middle of July, always a month, or nearly so, later than the other species; has a pungent, acrid taste; a powerful smell,

similar to *Oleum Origanum* ; keeps in bloom frequently until the middle of November, which the other seldom does after August ; and is altogether a larger plant, with the branches longer and straggling, growing in tufts, seldom found on dry sandy rocks or very dry ditches, but abundant in pastures, and stiff, cold soils, where *T. Serpyllum* is never found. It does not creep and root like the latter, unless the ants build their citadel around the stems, which they much like to do. The *Thymus* flourishes remarkably from this incident. These old ant-hillocks are beautiful objects in our pastures, when densely covered with the blooming *Thymus*, like so many coronets of gems.

“ I have now pointed out to the exploring botanist the characters of these two very distinct species of British *Thymus* ; whereby they may be identified at any season of the year. Should botanists not be able to do so, the sheep will, being the better phytologists : they will readily eat the one, but will not touch the other, on account of its pungency.

“ Some years ago, I pointed out the difference between these two plants to several eminent botanists, and sent specimens to others. I also sent specimens of each to the herbarium of the Worcestershire Natural-History Society. Probably from not studying their different habits, I did not then consider them distinct species. I believe no two plants belonging to the same genus have a greater physical difference. I have raised many plants, of each species, from seed, which exactly followed the present plants. A specimen of each is enclosed.”
—*George Jorden ; Bewdley, October 25, 1853.*

Trifolium resupinatum in Cheshire.

“ Whilst lately reviewing my British specimens of the genus *Trifolium*, I was reminded of the possession of a fine example of this species. It was presented to me, in the autumn of 1847, by my friend, S. Thompson, of York, who had collected it a few weeks before in the neighbourhood of the Magazines, near New Brighton, on the Cheshire side of the Mersey. Neither of us being at that time acquainted with the species, the specimen was duly labelled, and laid aside amongst my papers, and was not recognized as *T. resupinatum* till quite recently. It would be desirable for those who may have an opportunity of visiting the locality to search for it again, as it is not unlikely that this species might thereby be restored to an honourable position amongst our indigenous plants. It may be worth while to remark that the same station produces its nearest ally amongst British species, *T. fragiferum*.”—*John G. Baker ; Thirsk.*

Trifolium agrarium in Hertfordshire.

“ I may also take this opportunity of mentioning, that amongst a collection of plants made in the neighbourhood of Hitchin, in the years 1815, 1816, and 1817, is a specimen of *T. agrarium*, *L.* As it has not been heard of since, and it is a plant too conspicuous to be easily overlooked, it seems most probable that it has been only a casual introduction ; although, from its continental distribution, this species would seem not unlikely to occur in a wild state in this country.”—*Id.*

Bifid and Trifid Ferns.

“ The remarks of M. Piquet (Phytol. iv. 1135) tend to confirm a belief I have some time held, that *all* ferns have a tendency to become bifid, and in some instances multifid. Several of those named by that gentleman I have gathered in this county, in a bifid state, and *Aspidium Filix-mas*, *Hooker*, multifid. One specimen of *Aspidium angulare* I possess very distinct, being divided as much as *nine* inches down the frond. A friend recently received, from Hampshire, a frond of the rare *Asplenium fontanum*, which is likewise bifid. *Polypodium vulgare* assumes the most fantastic forms : I have a great number of varieties of this plant which, step by step, connect it with *P. Cambricum*. Thus we see this tendency pervading many ferns, from some of the commonest to one of the rarest ; and I doubt not others might be discovered. Is this state permanent ? As far as *Scolopendrium vulgare* goes, I believe the multifid variety has been growing in one habitat in this county for some years ; thus giving a colour to the belief that these forms *may* be permanent, if *undisturbed*. Two spots where I have found the bifid variety of *S. vulgare* I intend to examine again next year, to see if the forms are reproduced.”—*T. W. Gissing, Worcester, November 7, 1853.*

Udora Canadensis and Potamogeton trichoides in Norfolk.

“ I forward you a specimen of *Udora*, which I met with in a pond at Swainsthorpe, Norfolk, on Sept. 20, 1853. With its history in connexion with the pond I have no means of becoming acquainted. The latter is about 170 paces in circumference, and its margin so overgrown with bushes that I had difficulty in getting at the plant. There is neither navigable river nor canal in its neighbourhood.

“ Respecting *Potamogeton trichoides*, further search has led to the discovery of a more extended distribution of it in Norfolk. Last

year, I met with it in two additional ponds, in the parish of Swardeston. I have this year to add another in the same parish, three in the parish of Marlingford, one in that of Flordon, and one in Alington. I enclose specimens, in fruit, from these localities."—*Kirby Trimmer ; Norwich, October 13, 1853.*

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

(Continued from page 1108).

Flax Plant.

A paper by Prof. Hodges, intituled 'Report on the Gases evolved in Steeping Flax, and on the Composition and Economy of the Flax Plant,' was read.

The investigations directed by the Association, at the Belfast Meeting, with respect to the gases evolved in the steeping of flax and the composition of flax straw, are in progress, and will be reported at the Meeting. The gases of the fermenting vat have been analyzed by the methods of Prof. Bunsen, and have been found to consist of carbonic acid, hydrogen, and nitrogen. No sulphuretted hydrogen has, in any case, been detected. Several analyses of the proximate constituents of the dressed fibre and of its inorganic ingredients have been made, which show that a considerable amount of the nitrogenized and other constituents of the plant are retained in the fibre, even after steeping and dressing have removed the structures unsuitable for textile purposes.

Vegetable and Animal Organisms.

A paper by R. Warington, Esq., 'On Preserving the Balance between Vegetable and Animal Organisms in Sea-water,' was read.

The public were first indebted to Mr. Warington for a statement of the conditions in which animals could be kept in fresh water without changing the water. It is not sufficient that there be plants alone ; but where the higher animals, such as fish, are kept, it is necessary that some beings should exist which will feed on decaying vegetable matter. This desideratum is supplied by the various forms of phytophagous Mollusca. The author's success with fresh water led him to try experiments with sea water, and the results of his investigations were given in this paper. The most important fact esta-

blished was, that marine animals could be kept in sea water without changing in the same manner as in fresh. The conditions of the existence of sea-water creatures are, however, much more varied than those of fresh ; hence the difficulty had been proportionally great in arriving at a successful issue. The nature of the plants in the first place is a matter of importance. The author found that the green sea-weeds answered better than the red or brown. In introducing animals they should be healthy and uninjured. Those should not be put together which devour each other. Crabs, especially the common crab, are very destructive ; so are gobies, blennies, and rock-fish. The sea-water should be kept of a proper gravity. It should be 1.026 at a temperature of 60°. Rain or distilled water should be added from time to time to supply any loss. All dead animal or vegetable matter of any kind should be removed.

Dr. Daubeny stated that he had erected some fresh-water tanks at Oxford ; but the difficulty which he had to contend with was the growth of *Confervæ*, which interrupted the growth of the other plants.

Dr. Walker-Arnott stated that he had no doubt the reason why the green sea-weeds answered better than the brown or red was that the latter were deep sea, whilst the others were shallow water, plants. The brown and red sea-weeds also had a much denser tissue externally than the green sea-weeds, and did not grow so fast.

A paper by Dr. Astley Price, 'On the Pentasulphide of Calcium as a Remedy for Grape Disease,' was read. (See *Phytol.* iv. 1104).

Germination of Seeds.

A paper by R. Hunt, Esq., 'On a Method of Accelerating the Germination of Seeds,' was read.

The process consisted in covering the germinating seeds with glass coloured blue with cobalt. The author read a letter from the Messrs. Lawson, in which they stated that by allowing seeds to germinate under blue glass, they had succeeded in raising a larger number of seeds in a given time, as well as producing germination in a shorter time.

Report on the Vitality of Seeds.

The report, by the late H. E. Strickland, Esq., gave an account of the seeds which had been planted during the past year ; from which it appeared that the older the seeds were, the less numerous were those that germinated. The author thought that the experiment of

Mr. Hunt suggested an alteration in the plan which they had hitherto adopted, which would undoubtedly be attended to by the Committee.

GERMAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.*

The German naturalists and physicians held their thirtieth meeting this year at Tübingen, on the 18th ultimo. It was attended by about 580 members, including a moderate sprinkling of French and Russians, two Americans, and a few English.

The meeting at Tübingen was not so numerous as that last year at Wiesbaden. Tübingen, though offering considerable attractions, by its situation in one of the finest parts of Swabia, by its scientific institutions, and by its reputation as a University, is not yet connected with the great European railway net; and people do not like travelling now in slow mail-coaches even for a day. Another cause was, that the President, Professor Hugo von Mohl, elected last year, did not do his duty. For reasons best known to himself, he did not appreciate the honour which the votes of nearly 1000 scientific men from all parts of the world had conferred upon him. Instead of endeavouring to further the object of the Society, he tried everything in his power to prevent the meeting from being held at all; and when he found that the patriotism of his townsmen did not allow them to go the same way with himself, he departed for Italy, leaving the whole business to be arranged by the Vice-President, Mr. Bruns, Professor of Medicine at Tübingen. Professor Bruns, much to his credit, took up the matter warmly, and so thoroughly succeeded in arousing the interest of the University and the towns of the neighbourhood, that the reception of the learned guests was of the most cordial nature. Tübingen itself had a very festive appearance. Outside the gates of the city triumphal arches, with streamers and flags floating upon them, had been erected, and within, nearly every house was decorated with garlands of oak-leaves and gay flowers; whole spruce-trees had temporarily been planted before some of the buildings, and even in the dwellings of the humbler classes of inhabitants, attempts—aye, and some very successful ones—had been made to do something towards showing that the strangers were heartily welcome. It is unnecessary

* From the 'Literary Gazette,' October 22, 1853.

to develop the effect which such a reception produced upon the meeting; every one seemed to be happy, and at the first general dinner there was such a profusion of spirited speeches and toasts as are seldom heard on similar occasions. Preserving the scientific form, and moving only within the bounds of scientific terminology, several of the speakers told their audience some very amusing things of everyday life, and caused a great deal of laughter. Quenstedt, the geologist, and Veesenmeyer, the botanist, succeeded in rousing the merriment of the party to the highest pitch. On the 21st of September an excursion was made to Rottenburg, an ancient Roman town, and thence to the Niedernau, a modern watering-place. There were no less than 600 carriages, including cabs, omnibuses, and mail-coaches. In Rottenburg the naturalists were received by the Lord Mayor and Corporation. The principal street was most ingeniously ornamented; about 6000 hop-poles, with the graceful creeper around them, had been erected at suitable distances from each other, thus forming a complete avenue. The appearance they presented contrasted charmingly with the venerable old buildings, and the bright sun, the sweet smell of the hop, the flags and festoons, the music, the friendly faces of the inhabitants, the numerous huzzas, and the waving of handkerchiefs, formed altogether a scene of a very impressive kind. In Niedernau, where, after leaving Rottenburg and passing several villages, the carriages arrived, a good dinner was waiting, the President of the Society being aware that no one descended from Teutonic stock considers a festival complete without something substantial to eat. At dinner, the health of Uhland and Justinus Kerner was drank. The presence of these two old poets, who have both endeared themselves by their patriotism to their countrymen, and have done so much towards making German literature what it is, called forth the greatest enthusiasm, which was the more real in a district which their writings have rendered classical ground, and where one cannot look at a ruin, or visit a town, that is not already associated in one's mind with some popular ballad or romance of these men. On the 23rd of September, an excursion was made to Reutlingen, formerly one of the free Rix-cities, but now a manufacturing town belonging to Wirtemberg. In the time of the last revolution, a great political meeting was held here, which gave rise to the fearful struggle in Baden. On the day mentioned, it presented a very peaceable appearance. On passing the boundaries of the town, the naturalists were received by two heralds on horseback, in the costume of the middle ages, both holding banners in their hands. The one was dressed in the colours of Reutlin-

gen; the other in those of Germany—black, red, and gold. Just outside the city gates there was a triumphal arch, and the cathedrals and all the steeples of the churches were profusely decorated with flags and streamers. The weather was beautiful. In one of the public gardens the dinner table had been spread in the open air, where at least 1500 people sat down. During dinner a well-conducted band kept playing. A fine effect was produced by a chorus of singers, consisting of peasants, both men and women, of the neighbouring district; they were all dressed in their native costume, and, headed by a fine-looking fellow of their party, who carried their banner, they marched around the table at which the naturalists were sitting. After dinner, most of the party paid a visit to the Achalm, the ruins of a castle mentioned in one of Uhland's ballads. The view from thence was charming. The vineyards surrounding the ruin, the town of Reutlingen, the rivulets, the distant chain of mountains, with its old feudal castles, formed a pleasing panorama, and amply repaid the exertions of those who, after taking in a hearty dinner, and letting the wine-bottle pass freely, had climbed the summit. In returning about eight o'clock in the evening to Tübingen, there was a firework on the top of the hill on which the castle is built. It produced almost a magical effect to see the old Gothic building illumined by the different-coloured fires, and the numerous rockets, with their blue, red, and white nuclei, shooting up into the sky. In short, there was plenty of amusement during the whole time of the meeting. Balls, concerts, dinner-parties alternated with each other; there was even once, so as to give a notion of German-student life, a representation of a "Kneipe," in which grave professors, throwing aside for a while all reserve, acted the part of students and freshmen.

The scientific part of the meeting was equally satisfactory. In the three general or public sittings none but subjects treated in a popular manner were this time admitted, and all papers that could in the least offend the ear of ladies had been strictly rejected,—a laudable restriction, probably adopted in consequence of the complaints made by the press that medical subjects not intended for any but medical men had been brought forward. One of the first speakers was Jaeger, of Stuttgart, who gave a brief account of the last year's labours of the Imperial L. C. Academy of Naturalists, detailing that, as the first German institution, it had assumed the protectorship over the Societies of German Physicians at Paris and New York, that it had asked for three prize essays, and that the King of Wirtemberg had shown his good will towards the Academy by presenting it with a sum of money, to

be devoted to scientific exploring expeditions. Schultz, Bip., read an interesting paper 'On the Development of the Natural Sciences from the Middle of the Sixteenth Century until the Middle of the Nineteenth.' He assumed three periods:—1st, The period when knowledge was handed down by oral tradition; 2nd, When it was propagated by writing; and, 3rd, When perpetuated by printing. The present time he looks upon as the commencement of a fourth period, when, by the intimate international intercourse and the power of steam, knowledge is rapidly diffused. Dove, of Berlin, gave a comprehensive account of the present state of meteorology, and a very clear explanation of the causes which determine the weather of Europe. Carnal spoke on the importance of salt, gold, and coal,—three monosyllables playing an important part in the affairs of the world. He complained of the ignorance prevailing in England on the subject of German coal, and quoted a conversation he had with an Englishman of scientific standing, who asked him whether there were any coal in Germany?—a question he answered by stating that not only had Germany enough coal for her own use, but could supply England and all the world, at the rate coal is now used, for 500 years to come. Fraas gave an account of the oldest inhabitants of the Swabian Alps. It appears that a few years ago fossil teeth were found which some at once declared to be those of man. This determination, however, was called into question, as no human teeth of the mammoth period had ever been found in any part of the globe. Again, these teeth were exhibited last year in Wiesbaden, by Jaeger, when they were generally admitted to be human teeth; one was even sent to Owen, who agreed with the Wiesbaden meeting in pronouncing them to belong to man. The discovery of several almost perfect skulls has set the matter finally at rest: there was a race of men living simultaneously with the mammoth and other huge antediluvian animals. Gumbel read a paper on Mosses, explaining their importance in the economy of Nature, their great use to man, with whom they appeared together upon the earth. Veesenmeyer gave a spirited sketch of the Kirguises, and with a power of language reminding one of Humboldt's 'Views of Nature,' he described their relation towards plants and animals.

The sectional meetings were well attended. In the section for Chemistry and Pharmacology there were Fehling, Schlossberger, Leube, Babo, Weidenbusch, Ammermuller, Fresenius, Weltzien, H. Rose, &c.; Fehling and Rose alternately presided. In the section for Mathematics, Physics, and Astronomy, we noticed Wolfers, Osann, Reusch, Dove, Holtzmann, Gugler, &c.; Dove and Osann presided.

The section for Medicine and Surgery counted the largest number of members. We may mention Ritter, Virchow, Heyfelder, Erlenmeyer, Fraas, Vierodt, &c.; Virchow was elected President. The Botanical section counted amongst its members Martens, Veesenmeyer, De Bary, Steudel, Schnitzlein, Hochstetter, and elected Schultz, Seemann, and Gumbel Presidents. The section for Anatomy, Physiology, and Zoology was attended by Luschka, Ecker, Focke, Wutzer, and was presided over by Rapp. The section for Geology, Mineralogy, and Geography was represented by Carnal, Quenstedt, Strombeck, Glocker, Desor, Gerlach, Stocker, &c., and elected Merian President.

The Imperial L. C. Academy of Naturalists, which may be looked upon as the nucleus of the Society, held two sittings under the Presidency of Professors Jaeger and Heyfelder. Dr. Nees von Esenbeck, the President, was unfortunately prevented by illness from attending. In a letter of his addressed to Jaeger he gave a favourable statement of the affairs of the Academy, showing that there were at present a greater number of first-rate scientific papers for publication in the 'Nova Acta' than at any former period. The topics of discussion referred chiefly to the affairs of the Academy, and have not yet been made public.

On the 24th of September the meetings were finally closed. Göttingen was chosen as the place of meeting for 1854, and Professors Listing and Baum were elected Presidents of the Society.

According to the 'Bonplandia,' three Englishmen have, on the 18th of August, been elected Members of the Imperial L. C. Academy; viz., 1, John Smith, Esq., who received the cognomen "Kunze;" 2, Dr. Thomas Thomson, to whom the title "Hamilton" was given; and, 3, John Miers, Esq., on whom the name "Kunth" was conferred.

NOTICES OF NEW BOOKS, &c.

'*The Annals and Magazine of Natural History*,' No. 71, November, 1853. London: Taylor & Francis. Price 2s. 6d.

After an absence of any botanical papers since we last noticed this scientific journal, we have two in the November number. These are intitled:—

‘On the Nucleus of the Characeæ; by Al. Braun;’ being a translation by Mr. Henfrey.

‘Note on the Parasitism of *Comandra umbellata*; by Asa Gray.’
Extracted from ‘Silliman’s Journal.’

In North America, the genus *Comandra* replaces the European genus *Thesium*. After giving Mr. Mitten full credit for his important discovery of the parasitism of *Thesium linophyllum*, a full account of which was published in Hooker’s ‘Journal of Botany,’ and in the ‘Phytologist,’ Dr. Gray goes on to describe a similar discovery as regards *Comandra*. “My esteemed correspondent, Mr. Jacob Stauffer, of Mount Jay, Lancaster county, Pennsylvania, has recently sent me fresh specimens of *Comandra umbellata* with its elongated and woody subterranean stems, giving off numerous roots, the branches of which are often expanded at their tips into a small tubercle or sucker, which is implanted by its disk-like surface upon the bark of adjacent roots, principally of shrubs. The foster plants in the specimens communicated, are blueberries and huckleberries (*Vaccinium vacillans* and *Gaylussacia resinosa*). Mr. Stauffer’s specimens are accompanied by a neat drawing, illustrating the mode of attachment. This I would gladly forward for the engraver; but it will suffice perhaps for the present to say that the attachment is similar to that so clearly exhibited by Mr. Mitten, in the plate which accompanies his article; only that the rootlets in *Comandra* are from subterranean stems, and the suckers, so far as I have examined, do not appear to penetrate the foster root deeper than the surface of its wood.

“Since the above was in type I have received from Mr. Stauffer the announcement of his discovery of the parasitism of *Gerardia flava*, accompanied by a drawing which exhibits it, and a specimen which plainly shows the attachment. The numerous branches of the root are not only attached by disks or suckers to the bark of the root of the foster plant (in this case either white oak or white hazel), but are also implanted on each other, forming parasitical anastomoses.”—*Silliman’s Journal*, Sept. 1853.

The subject of root-parasitism, which has been established so completely in *Orobanche*, *Lathræa*, *Thesium*, and now in *Comandra* and *Gerardia*, and proof of which has hitherto so completely failed in *Monotropa*, is one of surpassing and absorbing interest. Decaisne is said to have detected it in *Pedicularis* and *Melampyrum*; but his conclusions have been the objects of some controversy, and much difference of opinion. It is well known to cultivators that all attempts to grow the *Rhinanthaceae* plants, otherwise than amid a host of

herbage which shall fill the soil with a network of roots, have proved utterly futile. How valuable, then, would be a carefully prepared paper on this subject, confined even to the British Isles, giving the result of a series of experiments, with the names of each parasite and its foster parent, and fully describing the mode and conditions of parasitism.

'Palm-trees of the Amazon, and their Uses. By ALFRED RUSSEL WALLACE.' London: Van Voorst. 1853. Post 8vo. 138 pp. Text, 48 Plates. Price 10s. 6d.

This is an admirable little book, creditable alike to the author and the artist. Mr. Fitch, long and favourably known as a botanical artist, has here excelled himself; his designs of the palms are really beautiful, and show how much may be done in a small compass. There is here an unusual combination of botanical accuracy with artistic and picturesque effect. Mr. Wallace is comparatively unknown as an author, but not as a naturalist. His sufferings and losses on board the unfortunate 'Helen,' having been detailed by himself, in a recent number of the 'Zoologist,'* have become familiar to all who take an interest in the well-being of those adventurous and energetic men who, as Natural-History collectors, have, during the last few years, added so enormously to our knowledge of the productions of distant countries. The object of the work before us is fairly and lucidly explained in the author's Preface, as below:—

"The materials for this work were collected during my travels on the Amazon and its tributaries from 1848 to 1852. Though principally occupied with the varied and interesting animal productions of the country, I yet found time to examine and admire the wonders of vegetable life which everywhere abounded. In the vast forests of the Amazon valley, tropical vegetation is to be seen in all its luxuriance. Huge trees with buttressed stems, tangled climbers of fantastic forms, and strange parasitical plants everywhere meet the admiring gaze of the naturalist fresh from the meadows and heaths of Europe. Everywhere too rise the graceful palms, true denizens of the tropics, of which they are the most striking and characteristic feature. In the districts which I visited they were everywhere abundant, and I soon became interested in them, from their great variety and beauty of form,

* Zool. 3641, No. CXIX.

and the many uses to which they are applied. I first endeavoured to familiarize myself with the aspect of each species, and to learn to know it by its native name ; but even this was not a very easy matter, for I was often unable to see any difference between trees which the Indians assured me were quite distinct, and had widely different properties and uses. More close examination, however, convinced me that external characters did exist by which every species could be separated from those most nearly allied to it, and I was soon pleased to find that I could distinguish one palm from another, though barely visible above the surrounding forest, almost as certainly as the natives themselves. I then endeavoured to define the peculiarities of form or structure which gave to each its individual character, and made accurate sketches and descriptions to impress them on my memory. These peculiarities are often very slight though permanent :—in the roots, the extent to which they appear above the ground ;—in the stem, the thickness, which in each species varies within very definite limits,—the swelling of the base, the middle or the summit,—its generally erect or curving position,—the nature of the rings with which it is marked,—the number, direction and form of the spines or tubercles with which it is armed ;—in the leaves, the erect or drooping position, the size and form of the leaflets, the angles which they form with the midrib, and the proportionate size of the terminal pair, are all important characters. The fruit-spike or spadix is either erect or drooping, either simple, forked, or many-branched ; and the fruits in closely allied species vary in size, in shape, and in colour, as well as in the bloom, down, hair or tubercles with which they are clothed.

“ In this little work careful engravings from my original drawings are given, with a general description of each species, and a history from personal observation of the various uses to which it is applied, and of any other interesting particulars connected with it. Several of the species here figured are new, among them is the palm which produces the ‘ piassaba,’ the coarse fibrous material of which brooms for street-sweeping are generally made.”—P. iii.

The following extract will show the universal use of palms by the Indian tribes, and their unspeakable importance to these primitive children of the forest.

“ Suppose then we visit an Indian cottage on the banks of the Rio Negro, a great tributary of the river Amazon in South America. The main supports of the building are trunks of some forest tree of heavy and durable wood, but the light rafters overhead are formed by the straight cylindrical and uniform stems of the Jará palm. The

roof is thatched with large triangular leaves, neatly arranged in regular alternate rows, and bound to the rafters with sipós or forest creepers; the leaves are those of the Caraná palm. The door of the house is a framework of thin hard strips of wood neatly thatched over; it is made of the split stems of the Pashiúba palm. In one corner stands a heavy harpoon for catching the cow-fish; it is formed of the black wood of the Pashiúba barriguda. By its side is a blowpipe ten or twelve feet long, and a little quiver full of small poisoned arrows hangs up near it; with these the Indian procures birds for food, or for their gay feathers, or even brings down the wild hog or the tapir, and it is from the stem and spines of two species of palms that they are made. His great bassoon-like musical instruments are made of palm stems; the cloth in which he wraps his most valued feather ornaments is a fibrous palm spathe, and the rude chest in which he keeps his treasures is woven from palm leaves. His hammock, his bow-string and his fishing-line are from the fibres of leaves which he obtains from different palm trees, according to the qualities he requires in them,—the hammock from the Mirití, and the bow-string and fishing-line from the Tucúm. The comb which he wears on his head is ingeniously constructed of the hard bark of a palm, and he makes fish-hooks of the spines, or uses them to puncture on his skin the peculiar markings of his tribe. His children are eating the agreeable red and yellow fruit of the Pupunha or peach palm, and from that of the Assaí he has prepared a favourite drink which he offers you to taste. That carefully suspended gourd contains oil, which he has extracted from the fruit of another species; and that long elastic plaited cylinder used for squeezing dry the mandiocca pulp to make his bread, is made of the bark of one of the singular climbing palms, which alone can resist for a considerable time the action of the poisonous juice. In each of these cases a species is selected better adapted than the rest for the peculiar purpose to which it is applied, and often having several different uses which no other plant can serve as well, so that some little idea may be formed of how important to the South American Indian must be these noble trees, which supply so many daily wants, giving him his house, his food, and his weapons.”—P. 9.

If we turn from this comprehensive picture to either individual palm-portrait, whether of pen or pencil, we shall find it sketched with the same freedom of hand, and finished with the same painstaking care. Take, for instance, the following:—

Assaí (*Euterpe oleracea*).—“This species is very abundant in the neighbourhood of Pará, and even in the city itself. It grows in

swamps flooded by the high tides,—never on dry land. Its straight cylindrical stem is sometimes used for poles and rafters ; but the tree is generally considered too valuable to be cut down for such purposes. A very favorite drink is made from the ripe fruit, and daily vended in the streets of Pará. Indian and negro girls may be constantly seen walking about with small earthen pots on their heads, uttering at intervals a shrill cry of Assaí-í. If you call one of these dusky maidens, she will set down her pot, and you will see it filled with a thick creamy liquid, of a fine plum-colour. A pennyworth of this will fill a tumbler, and you may then add a little sugar to your taste, and you will find a peculiar nut-flavored liquid, which you may not perhaps think a great deal of at first ; but, if you repeat your experience a few times, you will inevitably become so fond of it as to consider ‘Assaí’ one of the greatest luxuries the place produces. It is generally taken with farinha, the substitute for bread prepared from the mandioca root, and with or without sugar according to the taste of the consumer.

“ During our walks in the suburbs of Pará we had frequently opportunities of seeing the preparation of this favorite beverage. Two or three large bunches of fruit are brought in from the forest. The women of the house seize upon them, shake and strip them into a large earthen vessel, and pour on them warm water, not too hot to bear the hand in. The water soon becomes tinged with purple, and in about an hour the outer pulp has become soft enough to rub off. The water is now most of it poured away, a little cold added, and a damsel, with no sleeves to turn up, plunges both hands into the vessel, and rubs and kneads with great perseverance, adding fresh water as it is required, till the whole of the purple covering has been rubbed off and the greenish stones left bare. The liquid is now poured through a wicker sieve into another vessel, and is then ready for use. The smiling hostess will then fill a calabash, and give you another with farinha to mix to your taste ; and nothing will delight her more than your emptying your rustic basin, and asking her to refill it.”—P. 23.

• *Pashiúba miri* (*Iriartea setigera*). — “ This species is of great importance to the Indian of the Rio Negro. With its stem he constructs his ‘gravatána’ or blowing tube, which, with the little arrows before described as made from the spines of the Patawá, forms a most valuable weapon, enabling him to bring down monkeys, parrots and curassow birds from their favorite stations on the summits of the loftiest trees of the forest.

“When he wishes to make a ‘gravatána’ he searches in the forest till he finds two straight and tall stems of the ‘Pashiúba miri’ of such proportionate thicknesses that one could be contained within the other. When he returns home he takes a long slender rod which he has prepared on purpose, generally made of the hard and elastic wood of the ‘Pashiúba barriguda,’ and with it pushes out the pith from both the stems, and then with a little bunch of the roots of a tree fern, cleans and polishes the inside till the bore becomes as hard and as smooth as polished ebony. He then carefully inserts the slenderer tube within the larger, placing it so that any curve in the one may counteract that in the other. Should it still be not quite correct, he binds it carefully to a post in his house till it is perfectly straight and dry. He then fits a mouth-piece of wood to the smaller end of the tube, so that the arrow may go out freely at the other; and when he wishes to finish his work neatly, winds spirally round it from end to end, the shining bark of a creeper. Near the lower extremity, he forms a sight with the large curved cutting tooth of the Paca (*Cælogenus paca*), which he fixes on with pitch, and the gravatána is then fit for use.”—P. 39.

‘*The Handbook of British Ferns.* By THOMAS MOORE, F.L.S., &c., &c., Curator of the Botanic Garden of the Society of Apothecaries, Chelsea, and Author of the ‘Popular History of British Ferns,’ &c., &c.’ Second Edition. London: R. Groombridge & Sons, and W. Pamplin. 1853. 16mo. 232 pp. Text; numerous Woodcuts. Price 5s.

It is a difficult task to notice this work; but my voluntary offer on the wrapper of the last number compels me to do so. I have only one observation to make respecting it; and that is, that, although there can be no rational objection to one author borrowing an occasional sentence or idea from another, nevertheless he is bound, in manly candour, in common courtesy, to acknowledge the obligation. Now, Mr. Moore has throughout availed himself of my ‘British Ferns,’ not only without acknowledgment, but, as I think, without judgment. When I say without judgment, I mean to say that he has adopted the incorrect equally with the correct. Thus, my *correct* figure of *Trichomanes speciosum*, at page 315, and my very *incorrect* and unbotanical enlarged figure of a fragment of the same plant, at p. 316, are copied, without acknowledgment, at p. 201 of the ‘Handbook.’ Of

course the incorrect figure is omitted in my third edition ; and so it will hereafter stand as Mr. Moore's own.

In instances, Mr. Moore has ventured to differ from me ; but, whenever this is the case, he is obscure in his explanations. Thus, on the "dilatata group" he asserts, at p. 118, that *uliginosa* is *exactly intermediate* between *cristata* and *spinulosa*, and, at p. 131, that *glandulosa* is *quite intermediate* between *dilatata* and *spinulosa* ; yet he asserts that *cristata*, *uliginosa*, and *spinulosa* constitute one species, and *dilatata*, *uliginosa*, &c., another ; and, at p. 114, he says these two species are *readily distinguished*. This is as if a man should say that A and B are *readily distinguished* from C and D, but that D is *quite intermediate* between B and C. Like confusion occurs in the *Woodsias*, &c.

I cannot object to this book as doing me an injury ; I think it will rather excite a thirst for that more correct knowledge which, for sixteen years, I have been anxiously endeavouring to acquire, and which, from time to time, I shall do my best to make public.

EDWARD NEWMAN.

On Potamogeton flabellatus, Bab.

By CHARLES C. BABINGTON, M.A., F.L.S.*

IN the second edition of the 'Manual of British Botany,' I introduced a note to the effect that a *Potamogeton* inhabiting the canal near Bath would probably prove to be a new species, belonging to the group of which *P. pectinatus* is the type. It is there stated that "its dry fruit is semi-obovate compressed with 3 (?) obscure keels on the back ;" and that its leaves have "transverse veins." The plant thus noticed was gathered by myself, so long ago as the year 1830 ; since which time I have scarcely ever visited Bath during the summer, and have thus had no opportunity of examining it in a living state.

In the interval between the publication of the second and third editions of the 'Manual,' I persuaded myself that the plant might safely be referred to *R. pectinatus* (still judging only from dried specimens in the flowering state), and therefore, in edition three, erased the remark that had previously appeared.

* Read at a meeting of the Linnean Society, Nov. 15, 1853 ; and communicated by the author.

In the first and second editions of the same book, there is also a plant described, under the name of *P. zosteraceus*, *Fries?* which was very slightly known to me, it having been noticed in Hyde Park only.

In the year 1849, my attention was again directed to the plant, by Mr. Borrer informing me that Mr. Kirk, of Coventry, had shown him plenty of *P. pectinatus* and *P. zosteraceus*, *Bab.*, growing near to that city. An application to the latter botanist obtained for me a series of most characteristic specimens of it, and convinced me (as an examination of the living plants had previously satisfied Mr. Borrer) that it was specifically distinct from *P. pectinatus* and *P. zosteraceus*, *Fries*. Accordingly, in the 'Manual' (ed. 3) the name of *zosteraceus* is changed into *flabellatus*, a term derived from the usually fan-shaped habit of the flowering plant.

To revert to the plant found near Bath. In the month of July, 1853, I had occasion to spend some days at that city, and took advantage of the opportunity to endeavour to determine the doubtful pondweed. At that time there were no flowers nor fruit to be found, but abundance of barren specimens. Fortunately, their young state enabled me to decide with certainty that which might have been only a probability at a later period. Plenty of the earlier leaves, although much tending towards decay, continued to be attached to the plants; and thus it became quite certain that they belonged to my *P. flabellatus*. On re-visiting Bath in the month of October, 1853, I was equally unsuccessful in obtaining fruit or flowers, but saw an abundance of the broad leaves which are so characteristic of the species.

As the plant is apparently still but little known, a few notes, extracted from my observations upon it, may not be out of place.

There is a prostrate perennial rhizome creeping at the bottom of the water or in the mud, rooting at its joinings, and clothed at longish intervals with short, black, rather loose, clasping sheaths. From this rhizome spring solitary, long, floating stems, which are simple below, but become very much branched as they approach the surface of the water, where they spread in a more or less fan-shaped manner. They are very thick and strong in their lower part, not filiform like those of *P. pectinatus*.

The sheaths of the lower leaves are very large. Those leaves vary considerably in width, but may always be described as broad; they have 3, and sometimes 5, nerves, quite distinct from the edge, with transverse connecting veins. They do not at all resemble the leaves of *P. pectinatus*, which are formed of two conspicuous tubes, interrupted at intervals by transverse membranes, and separated by a

rather wide cellular space, forming the so-called central nerve. The supposed lateral nerves, also, are only apparent in that plant, being visible solely after the leaves have been subjected to pressure, and are merely the result of it. The lower leaves of *P. flabellatus* are of equal thickness throughout, and have their sides uniformly curved inwards so as to form a segment of a cylindrical tube; when dry, 3 or 5 rather prominent ribs are formed on the back, by the shrinking of the intermediate cellular spaces: their end is abruptly but shortly cuspidate. The upper leaves, including probably all those that float at or near to the surface of the water, are much narrower, and very gradually acute; 3-nerved, but the lateral nerves often so close to the margin as to be nearly undistinguishable from it.

It is probable that *P. flabellatus* was known to Hudson; for he has a plant named *P. marinus*, "Habitat in fossis maritimis . . . prope Sheerness abunde" (ed. 1, p. 63), "In insula Shepey abunde" (ed. 2, p. 77), which he supposed to be the *P. marinus*, *Linn.*: also that the plant found at Yarmouth, as noted below, is the *P. marinus*, *Huds.*; for Mr. Woodward is recorded (*Wither. Bot. Arr.* ed. 3, ii. 214) to have gathered what is so called by Withering at that place. Fries has shown (*Novit. Fl. Suec.* ed. 2, p. 52 and 55) that the name *P. marinus*, *Linn.*, refers rather to the *P. filiformis*, *Nolte*, than to either *P. pectinatus*, *P. flabellatus*, or *P. zosteraceus*. As the name has been employed to designate each of them, by one or more authors, it seems desirable to allow it to fall out of use, for its retention only tends to cause confusion. At all events, the *P. flabellatus* has no claim to be considered as the *P. marinus* of Linnæus, although it probably is that of Hudson and Withering.

P. flabellatus is found at Denver, Norfolk; in the canal near Bath, Somerset; Mr. Kirk meets with it near Coventry, Warwickshire; Mr. Syme, at Gravesend, Kent; the Rev. W. W. Newbould has brought it to me from the fen-ditches between Hull and Hedon, Yorkshire, and from near Burnham, Norfolk; it has been gathered by the Rev. Kirby Trimmer in salt-water ditches near Great Yarmouth; and it is recorded in the 'Flora of Hertfordshire' as growing in the river Lea at Hertford and Ware (p. 276), and in the canal near Tring (App. p. 17).

CHARLES C. BABINGTON.

November, 1853.

APPENDIX
TO
THE PHYTOLOGIST
FOR 1851.

ART. I. — *Synoptical Table of the British Ferns.*
By EDWARD NEWMAN.

Obs. — This is confessedly but a crude attempt to arrange our ferns in accordance with their natural affinities. After maturely considering the associations upon which heretofore so much stress has been laid, I have arrived at the conclusion that they are unsatisfactory; and yet, in abandoning such divisions as Polypodium of the Linnean school; as Aspidium, so earnestly advocated by Smith and Hooker in this country, and equally great names on the Continent; and as the more recent combination called Lastrea by Presl and John Smith, and formerly adopted by myself; I feel as one groping his way in the dark, and shall eagerly avail myself of any friendly hand that may be held out to support and direct my tottering and uncertain footsteps.

VEGETABLES are divided by botanists into four primary groups, one of which, called Exogens, is single, and the others, severally called Endogens, Acrogens, and Thallogens, are double; that is, each of them contains two groups, which, in intimate structure, are alike, but in certain less important characters differ.

Acrogens are either Filicoid, or ferns and their allies; or Muscoid, or mosses and their allies.

Filicoid Acrogens are divided into seven secondary groups, called Orders; which however consist of a single one and three pairs: so that the divisions of the secondary, are in fact numerically identical with those of primary groups.

Primary groups are called *classes*, secondary groups *orders*. The seven orders of Filicoid Acrogens are these:—Polypodiaceæ; Osmundaceæ and Ophioglossaceæ; Marsiliaceæ and Lycopodiaceæ; Equisetaceæ and Characeæ.

The present paper treats only of the first, second and third of these orders, the British species of which are so few in number, that it is extremely difficult so to arrange them as to give any idea of a connected series.

Order.—POLYPODIACEÆ, *R. Brown*.

Plants composed of fibrous roots, solid simple rhizoma, and flat leafy fronds which rise with a circinate veneration and bear capsules in clusters on their back or edges. The capsules are provided with an elastic jointed ring. The divisions of this order are still obscure, and require further investigation; the subjoined arrangement is confessedly imperfect, but will probably be found convenient to those whose attention is chiefly confined to the European ferns.

Family.—ADIANTEÆ.

The ultimate divisions of the frond generally stipitate and leaf-like but without a mid-vein: clusters of capsules small, nearly circular, seated on the reflexed bleached margin: no apparent involucre.

Genus.—ADIANTUM, *Linneus*.

No mid-vein: veins of divisions of the frond variously branched, free at extremity: involucre not apparent: clusters of capsules nearly orbicular and situate on a bleached reflexed margin.

ADIANTUM CAPILLUS-VENERIS.

Adiantum Capillus-Veneris, *Linn. Sp. Pl.* 1559; *Lightf. Fl. Scot.* 679; *Huds. Fl. Ang.* 460; *Bolt. Fil. Brit.* 24, t. 29; *With. Arr.* 781; *Sm. E. F.* iv. 320, *E. B.* 1564; *Mack. Fl. Hib.* 344; *Newm. N. A.* 9, *F.* 83; *Hook. and Arn.* 576; *Bab.* 416.

Stipes black, shining, about the same length as the frond; frond deltoid, pinnate; pinnæ alternate, pinnate, pinnules stalked, leaf-like.

Sea-coast of Devonshire, Cornwall, Glamorganshire, Isle of Man, and South Isles of Arran.

Family. — PTERIDÆ.

Ultimate divisions of frond with a distinct mid-vein, lateral veins branched and united at their extremities by a distinct marginal vein, on which the capsules are placed in a continuous line, and are covered by the bleached reflexed epidermis.

Genus. — EUPTERIS, *Newman*.

Mid-vein distinct, lateral veins anastomosing at the margin, forming a marginal vein: involucre attached to inner side of marginal vein, linear, its margin split into capillary segments: capsules attached in a linear series to the marginal vein, exterior to the involucre: epidermis prolonged, bleached, reflexed, split into capillary segments and covering the capsules in the manner of an involucre.

EUPTERIS AQUILINA.

Pteris aquilina, *Linn. Sp. Pl.* 1533; *Lightf. Fl. Scot.* 657; *Huds. Fl. Ang.* 451; *Bolt. Fil. Brit.* 16, t. 10; *With. Arr.* 765; *Sm. E. F.* iv. 318, *E B.* 1679; *Mack. Fl. Hib.* 343; *Newm. N. A.* 11, *F.* 93; *Hook. and Arn.* 575; *Bab.* 415.

Eupteris aquilina, *Newm. Phytol.* ii. 278.

Rhizoma creeping; stipes long; frond deltoid, tripinnate, erect.

Abundant everywhere except on chalk.

Obs. — There are several other natural divisions of the Linnean genus *Pteris*, but neither of them contains British species. Messrs. Houlston and Moore, in their "Descriptive List of Cultivated Ferns," now in course of publication in the 'Gardeners' Magazine of Botany,' treat all the species of *Eupteris* as identical, thus making one species

cosmopolitan : in this conclusion, however, I am hardly prepared to agree.

Family. — BLECHNEÆ.

The ultimate divisions of the frond sessile, having a distinct mid-vein, the lateral veins anastomose in a linear series on each side of the mid-vein : capsules seated in a continuous line on that side of these anastomosing veins which is nearest the mid-vein, covered by a continuous linear lateral involucre, which opens towards the mid-vein.

Genus. — LOMARIA, *Willdenow*.

Mid-vein distinct, lateral veins anastomosing in a linear series on each side, parallel to the mid-vein, and emitting free branches to the margin : involucre linear, opening towards the mid-vein ; capsules in a linear series on the inner side of each anastomosing vein.

LOMARIA SPICANT.

Osmunda spicant, *Linn. Sp. Pl.* 1522 ; *Lightf. Fl. Scot.* 654 ; *Huds. Fl. Ang.* 450 ; *Bolt. Fil. Brit.* 8, t. 6.

Osmunda spicanthus, *With. Arr.* 763.

Blechnum spicant, *With. Arr.* 765.

Lomaria spicant (*Desv.*), *Newm. N. A.* 9, *F.* 89.

Blechnum boreale (*Swartz*), *Sm. E. F.* iv. 316, *E. B.* 1159 ; *Mack. Fl. Hib.* 343 ; *Hook. and Arn.* 575 ; *Bab.* 415.

Fronds of two kinds : fertile fronds erect, linear, pinnate ; pinnæ distant, reflexed, narrow, linear ; the lower portion of the stipes naked : barren fronds prostrate, lanceolate, pinnatifid ; pinnæ close, flat, broad, blunt.

Common on damp soils.

Family. — ASPLENIEÆ.

A large and varied group, approaching very nearly to the last, but constantly differing : the capsules are seated in linear clusters on one side of lateral veins, whose direction is always at an angle with the median line of the pinnule, so that in no instance can two or more of these lines of

capsules form a continuous line : each cluster is covered more or less completely by a linear lateral involucre.

Genus. — NOTOLEPEUM, *Newman*.

Mid-vein of pinnules present, lateral veins alternate, branched, branches anastomosing among themselves and with the branches of the next lateral vein : clusters of capsules on the first anterior branch of each lateral vein, and all of them directed towards the apex of the pinnule, except in the first lateral veins, both branches of which bear clusters, the anterior cluster directed as usual, but the posterior towards the midrib of the frond, these are therefore placed back to back : each cluster is accompanied by a narrow and nearly erect involucre, occupying the same position with regard to the capsules as that of a true *Asplenium* : the back of the frond is densely clothed with pointed overlapping scales.

Obs.—This genus has long been noticed as distinct, but I have seen no description in which the characters are correctly given. A new name seemed needful ; the names of *Scolopendrium*, *Grammitis*, and *Gymnogramma*, successively employed, have been severally restricted to very different genera, and that of *Ceterach* seems objectionable, as belonging of right to the species. A mode of overcoming the difficulty certainly exists in a repetition of the name, as *Ceterach Ceterach*, and this plan has been largely followed in the nomenclature of fishes, but I think it has not hitherto found its way into the science of Botany. Whenever it shall be introduced, there can be no doubt that the name of *Notolepeum* must give way.

NOTOLEPEUM CETERACH.

Asplenium Ceterach, *Linn. Sp. Pl.* 1538 ; *Lightf. Fl. Scot.* 661 ; *Huds. Fl. Ang.* 452 ; *Bolt. Fil. Brit.* 20, t. 12 ; *With. Arr.* 767.

Scolopendrium Ceterach, *Sm. E. F.* iv. 315, *E. B.* 1244.

Grammitis Ceterach (*Swartz*), *Mack.* 337.

Ceterach officinarum (*Willd.*), *Newm. N. A.* 28, *F.* 293 ; *Hook. and Arn.* 566 ; *Bab.* 415.

Notolepeum Ceterach, *Newm. F.* 9.

Stipes shorter than the frond ; frond linear-lanceolate, pinnatifid, divisions waved or lobed ; back of frond ferruginous with the dense covering of scales.

On limestone rocks, very local : on mortared walls, common in the West of England and South of Ireland.

Genus. — PHYLLITIS, *Newman*.

Lateral veins twice or thrice bifurcate, free at the extremity : capsules in linear series upon the anterior and posterior branches, on the anterior directed towards the apex of the frond, on the posterior towards its base, always in pairs, *i. e.*, when the anterior branch of a lateral vein bears a line of capsules, the posterior branch of the lateral vein next before it also bears a line of capsules corresponding in length, and the two lines or series form a confluent mass of capsules, covered by two involucres, which face each other, and even in an early stage of growth overlap and appear united.

Obs.—The name *Phyllitis* was employed by Ray and other eminent botanists of the pre-Linnean era, but I believe has not been used as generic since the introduction of the binominal nomenclature. I consider that the name of *Scolopendrium* should be confined, as intended by its author, to the species. As in the preceding instance, the repetition of the name, thus, *Scolopendrium Scolopendrium*, would be the strict application of the law of priority. The genus is generally acknowledged as distinct.

PHYLLITIS SCOLOPENDRIUM.

Asplenium Scolopendrium, *Linn. Sp. Pl.* 1537 ; *Lightf. Fl. Scot.* 660 ; *Huds. Fl. Ang.* 452 ; *Bolt. Fil. Brit.* 18, t. 11 ; *With. Arr.* 766.

Scolopendrium vulgare (*Sym. Syn.*), *Sm. E. F.* iv. 314, *E. B.* 1150 ; *Mack. Fl. Hib.* 342 ; *Newm. N. A.* 28, *F.* 289 ; *Hook. and Arn.* 574 ; *Bab.* 415.

Phyllitis Scolopendrium, *Newm. F.* 10.

Stipes shorter than frond ; frond pendulous, linear, strap-shaped, entire.

Common on stone walls, hedge-banks, &c., in damp places.

Genus. — AMESIUM, *Newm.*

Ultimate divisions without a distinct mid-vein : veins of ultimate divisions very few, sparingly branched, free at the extremities : involucres narrow, linear, frequently facing each other as in the preceding genus, but rarely overlapping.

Obs.—Roth unites the species of this genus with those of *Scolopendrium*, all other authors with *Asplenium*, from which, however, they appear to me abundantly distinct.

* *Fronde simple.*

AMESIUM SEPTENTRIONALE.

Acrostichum septentrionale, *Linn. Sp. Pl.* 1524 ; *Lightf. Fl. Scot.* 656 ; *Huds. Fl. Ang.* 450 ; *Bolt. Fil. Brit.* 12, t. 8 ; *With. Arr.* 764.

Asplenium septentrionale, *Sm. E. F.* iv. 308, *E. B.* 1017 ; *Newm. N. A.* 27, *F.* 269 ; *Hook. and Arn.* 572 ; *Bab.* 41.

Amesium septentrionale, *Newm. F.* 10.

Stipes and frond of equal length, their separation indistinct ; frond linear, narrow, gradually diminishing into the stipes, sometimes forked, apices of divisions bifid ; clusters of capsules in two, three, or four long linear series.

A small and rare fern, in rocky and mountainous places. Somerset, Caernarvon, Cumberland, Northumberland, Edinburgh.

** *Fronde linear, pinnate.*

AMESIUM GERMANICUM.

1770. *Asplenium germanicum*, *Weiss, Pl. Cr.* 299 ; *Willd. Sp. Pl.* v. 330 ; *Hoffm. Deutschl. Fl.* ii. 13 ; *Ehrh. Crypt.* 43 ; *Presl. Tent. Pteridog.* 108 ; *Newm. F.* 265 ; *Bab.* 414.

1779. *Asplenium Breynii*, *Retz, Obs. Bot. fasc. i.* 32 ; *Sw. Syn. Fil.* 85.

1781. *Asplenium alternifolium*, *Wulfen. Jacq. Misc. ii. 51* ;
With. Arr. 768 ; *Sm. E. F. iv. 309*, *E. B. 2258* ; *Newm.*
N. A. 27 ; *Hook. and Arn. 573*.

Amesium germanicum, *Newm. F. 10*.

Stipes shorter than frond ; frond linear, pinnate ; pinnæ alternate, distant, linear, ascending, bifid or trifid at the apex ; clusters of capsules linear.

A small and extremely rare plant. Caernarvonshire, Perthshire.

*** *Frond deltoid*.

AMESIUM RUTA-MURARIA.

Asplenium Ruta-muraria, *Linn. Sp. Pl. 1541* ; *Lightf. Fl. Scot. 665* ; *Huds. Fl. Ang. 453* ; *Bolt. Fil. Brit. 28, t. 16* ; *With. Arr. 769* ; *Sm. E. F. iv. 309*, *E. B. 150* ; *Newm. N. A. 27, F. 261* ; *Hook. and Arn. 573* ; *Bab. 414*.

Amesium Ruta-muraria, *Newm. F. 10*.

Stipes longer than frond ; frond deltoid, composed of a few diamond-shaped, stalked, leaf-like divisions ; clusters of capsules linear, becoming confluent and entirely covering the divisions of the frond.

A small fern, common on rocks and mortared walls.

Genus. — ASPLENIUM.

Mid-vein distinct ; lateral veins simple or branched : involucre linear, attached to the side of the vein, its free margin sometimes jagged, but not split into capillary segments.

* *Frond linear, pinnate*.

ASPLENIUM TRICHOMANES.

1753. *Asplenium Trichomanes*, *Linn. Sp. Pl. 1540* ; *Huds. Fl. Ang. 452* ; *Bolt. Fil. Brit. 22, t. 15* ; *With. Arr. 768* ; *Sm. E. F. iv. 305*, *E. B. 576* ; *Mack. Fl. Hib. 341* ; *Newm. N. A. 28, F. 285* ; 109 ; *Hook. and Arn. 573* ; *Bab. 414*.

1776. *Asplenium Trichomanoides*, *With. Bot. Arr. Veg.* 653; *Lightf. Fl. Scot.* 662.

Stipes generally shorter than the frond, purple throughout; frond pinnate; pinnae distant, stalked, ovate; clusters of capsules linear, nearly black.

Common on rocks, walls and hedge-banks.

ASPLENIUM VIRIDE.

1753. *Asplenium Trichomanes ramosum*, *Linn. Sp. Pl.* 1541; *With. Bot. Arr. Veg.* 654.

1762. *Asplenium viridi*, *Huds. Fl. Ang.* 385.

1777. *Asplenium viride*, *Lightf. Fl. Sc.* 663; *Huds. Fl. Ang.* 453; *Bolt. Fil. Brit.* 24, t. 14; *With. Arr.* 768; *Sm. E. F.* iv. 306, *E. B.* 2257; *Mack. Fl. Hib.* 341; *Newm. N. A.* 28, *F.* 281; *Hook. and Arn.* 573; *Bab.* 414.

Stipes somewhat shorter than the frond, purple at the base, otherwise green; frond very narrow, linear, pinnate; pinnae stalked, distant, diamond-shaped, toothed; clusters of capsules linear, at last confluent, rust-coloured.

On rocks in mountain districts only.

Obs.—In this instance the earliest name, *Asplenium Trichomanes ramosum*, is abandoned, because evidently given as that of a variety, not of a species. The second in date is also abandoned, because of its ungrammatical termination, subsequently corrected by the author himself.

ASPLENIUM MARINUM.

- Asplenium marinum*, *Linn. Sp. Pl.* 1540; *Lightf. Fl. Scot.* 664; *Huds. Fl. Ang.* 453; *Bolt. Fil. Brit.* 26, t. 15; *With. Arr.* 769; *Sm. E. F.* iv. 307, *E. B.* 392; *Mack. Fl. Hib.* 341; *Newm. N. A.* 27, *F.* 275; *Hook. and Arn.* 573; *Bab.* 414.

- Adiantum Trapeziforme*, *Huds. Fl. Ang.* 460; *With. Bot. Arr. Veg.* 655; but certainly not of *Linn. Sp. Pl.* 1559, as cited by early English authors.

- Adiantum Trapeziforme*, *Berk. Syn.* 309.

Stipes shorter than frond; frond pinnate; pinnae stalked, ovate, serrated; clusters of capsules linear, rust-coloured, always separate.

Common on rocks by the sea.

** *Frond deltoid.*

ASPLENIUM ADIANTUM-NIGRUM.

Asplenium Adiantum-nigrum, Linn. *Sp. Pl.* 1541; *Lightf. Fl. Scot.* 666; *Huds. Fl. Ang.* 454; *Bolt. Fil. Brit.* 30, t. 17, 3; *With. Arr.* 770; *Sm. E. F.* iv. 310, *E. B.* 1950; *Mack. Fl. Hib.* 342; *Newm. N. A.* 27, *F.* 255; *Hook. and Arn.* 573; *Bab.* 414.

Stipes longer than frond; frond elongate, deltoid, pinnate; lowest pair of pinnæ always longest, all the pinnæ pinnate; clusters of capsules linear, approximate to mid-rib.

*** *Frond lanceolate.*

ASPLENIUM LANCEOLATUM.

Asplenium lanceolatum, *Huds. Fl. Ang.* 454; *With. Arr.* 770; *Sm. E. F.* iv. 311, *E. B.* 240; *Newm. N. A.* 27, *F.* 249; *Hook. and Arn.* 573; *Bab.* 414.

"? *Asplenium obtusatum*, *Guss.*" *Bab. MSS.*

Stipes shorter than frond; frond semi-erect, lanceolate, pinnate; lowest pair of pinnæ shorter than the second pair, all pinnate or pinnatifid; clusters of capsules at first linear, afterwards circular, distant from midrib.

Local, and mostly maritime; chiefly upon stone walls. Caernarvonshire, Cornwall, Devon, Gloucestershire, Kent, Merionethshire, Sussex.

Genus. — *ATHYRIUM*, *Roth.*

Ultimate divisions generally distinct and leaf-like, each with a distinct mid-vein: lateral veins always branched: involucre crescent-shaped, its free margin split into capillary segments. The rhizoma or cormus is long-enduring, suberect, and often of very large size; it sometimes increases laterally, but generally from the centre, and occasionally, in very old individuals, it becomes erect and trunk-like, as in the tree-ferns. There is probably some difference between the species in this respect, but the subject has not obtained the attention of botanists.

Obs.—This genus has a very great similarity, in general habit, to that which immediately follows; a similarity also extending more or less to several genera of the following family: it is comprised in the genus *Aspidium* of Smith: it is now almost universally regarded as comprising but a single species, the *Polypodium Filix-femina* of Linneus, and the following synonyms are those of the genus.

Polypodium Filix-femina, *Linn. Sp. Pl.* 1551; *Lightf. Fl. Scot.* 673; *Huds. Fl. Ang.* 458; *With. Arr.* 778.

Polipodium Filix-femina, *Bolt. Fil. Brit.* 46, t. 25.

Aspidium Filix-fœmina (*Swartz*), and *Aspidium irriguum*, *Sm. E. F.* iv. 295, 6, *E. B.* 1459 and *E. B. S.* 2199.

Asplenium Filix-fœmina (*Bernh.*), *Mack. Fl. Hib.* 342; *Hook. and Arn.* 574.

Athyrium Filix-fœmina (*Roth*), *Newm. F.* 420; *Bab.* 413.

* *Frond deltoid.* (No ascertained British species).

(*ATHYRIUM DELTOIDEUM.*

Aspidium crenatum, *Sommerf. in Vet. Ac. Handlung.* 104.

Cystopteris crenata, *Fries, Nov. Fl. Suec.* 165; *Hook. Sp. Fil.* i. 200.

Stipes as long as the frond, pretty thickly clothed towards the base with dark brown lanceolate scales; frond deltoid, resembling that of *Eupteris aquilina*, but of smaller size, pinnate; pinnæ stipitate, lanceolate, pinnate; in the first pair of pinnæ the pinnules on the lower are longer than those on the upper side; pinnules pinnate, their lobes distant, but united at the base by the winged midrib of the pinnule, blunt, slightly lobed on the upper margin; clusters of capsules confined to the upper portion of the frond, rather scattered in an oblique series on each side of the midrib, and rather near it; involucre nearly linear, attached to the side of the capsuliferous vein, and opening towards the midrib, its free margin ragged.

North of Europe, in thick woods. Found by Mr. R. B. Bowman, in the Pass of Kringelen, in Norway.

Obs.—There exist a *Polypodium crenatum*, an *Aspidium crenatum*, and an *Athyrium Filix-femina*, var. *crenatum*; under these circumstances, a change of name will, I hope, be allowed. The plant is here

introduced as being likely to occur in Scotland, and also to show that the genus *Athyrium* is not restricted to the lanceolate form of frond).

**** *Frond lanceolate.***

ATHYRIUM OVATUM.

1795. *Polypodium dentatum*, Hoffm. *Deutsch. Flor.* ii. 6.

1800. *Athyrium ovatum*, Roth, *Fl. Germ.* iii. 64; Newm. *F.* 420, *Phytol.* iv. 368.

Athyrium Filix-femina, var. *dentatum*, Newm. *F.* 203, ad partem.

Asplenium Filix-fœmina, var. *latifolium*, Hook. and Arn. 574; Bab. 413; Houlston and Moore, *Gard. Mag. of Bot.* iii. 262.

Frond lax, flaccid, dark green, lanceolate, pinnate; pinnae scarcely ascending, approximate, flattened, pinnate; pinnules ovate, distinctly stalked, crowded, overlapping, lobed at the base, toothed at the apex; clusters of capsules elongate as in *Asplenium*, in a series on each side of the pinnule but *distant from it*. A large plant, two to three feet high.

Rare; found in the neighbourhood of Keswick by Miss Beever and Miss Wright.

Obs. — The prior name of *dentatum* is discarded on account of its identity with another *Polypodium dentatum*.

ATHYRIUM MOLLE.

Polypodium molle, Schreber, *Spic. Flor. Lips.* 70; Ehrh. *Crypt.* 9; Hoffm. *Deutsch. Flor.* ii. 6.

Athyrium molle, Roth, *Flor. Germ.* iii. 61; Newm. *N. A.* 26.

Athyrium Filix-femina, var. *molle*, Newm. *F.* 242.

Athyrium Filix-femina, γ. Bab. 413.

Frond lax, flaccid, bright green, broadly lanceolate, pinnate; pinnae scarcely ascending, approximate, flattened, pinnate, subpinnate, or pinnatifid; pinnules blunt, approximate, connected by the wing of the midrib; clusters of capsules in a series on each side of the midrib of the pinnule, and *very near it*. Generally a small plant, twelve to

eighteen inches high, when larger somewhat more divided, and then it is the *Polypodium trifidum* of Hoffman.

Common in woods.

ATHYRIUM INCISUM.

Polypodium incisum, Hoffm. *Deutsch. Flor.* ii. 6.

Athyrium Filix-femina, Roth, *Flor. Germ.* iii. 65.

Athyrium Filix-femina, var. *incisum*, Newm. *F.* 243.

Athyrium Filix-femina β . Bab. 413.

Frond suberect, subrigid, dull green, lanceolate, pinnate; pinnæ subdistant, pinnate; pinnules deeply incised or lobed, divisions dentate; clusters of capsules close, owing to the greater subdivision of frond not ranged in series, but crowded and finally confluent. A large plant, two to four feet high, and proportionably broad.

Common in wet woods. A much more beautiful fern than either of the preceding, and the type of the genus.

ATHYRIUM CONVEXUM.

Athyrium rhoeticum, Roth. *Flor. Germ.* iii. 67; Newm. *N.*

A. 26.

Athyrium Filix-femina, var. *convexum*, Newm. *F.* 245.

Athyrium Filix-femina, α . Bab. 413.

Frond pale green, erect, rigid, linear lanceolate, pinnate; the stipes and rachis semipellucid, and often beautifully coloured with purple or red; pinnæ distant, at first ascending, then spreading, and finally deflexed, extremely acute; pinnules distant, very narrow, linear, entirely unconnected, their margin convolute; clusters of capsules subrotund, close to the midrib of the pinnule, and finally covering their under surface, and themselves partially covered by the convolute margin of the pinnules.

Not uncommon in exposed localities.

Obs.—The seedlings of these plants are particularly abundant near the parent; they constitute the *A. rhoeticum*, var. *minus* of Roth, and the *Aspidium irriguum* of Smith.

Family. — POLYPODIEÆ.

A large and varied group. Capsules seated in circular clusters directly on the back of the lateral veins.

Genus. — PSEUDATHYRIUM, *Newm.*

Involucre wanting: clusters of capsules small, at first distinct, but often crowded when mature: first and second pinnules on each pinna, both above and below, of nearly corresponding size: ultimate divisions pointed but without spines: precisely the habit of *Athyrium*.

PSEUDATHYRIUM ALPESTRE.

Aspidium alpestre, *Hoppe, Taschenb.* (1805), 216; *Schkuhr*, 58.

Polypodium alpestre, *Koch.*

Aspidium rhæticum, *Swartz, Syn. Fil.* 59.

Polypodium rhæticum, *Woods, Tour. Fl.* 423.

Pseudathyrium alpestre, *Newm. Phytol.* iv. 370.

Rhizoma tufted; stipes shorter than frond; frond elongate, lanceolate, pinnate; pinnæ pinnate; pinnules approximate, lobed, lobes notched.

Scotland. Three specimens are in the herbarium of Mr. Watson, gathered by himself, one in Canlochen Glen, Forfarshire, a second on Ben Alder, and a third on "mountains near Dalwhinnie." Mr. Watson thinks it possible that, as he went from Dalwhinnie to Ben Alder, both the specimens last mentioned may be from the latter locality. Common in alpine districts of Europe, and will in all probability prove so in Scotland. Lightfoot, in describing the clusters of capsules in the Scotch specimens of *Filix-femina*, says they first appear as "*distinct round dots*;" he had probably seen the present species.

Obs. — In *Schkuhr's 'Handbook'* there is a reference to plate 60, which plate is named *Aspidium umbrosum*, but certainly represents this species.

Genus. — POLYSTICHUM, Schott.

Involucre circular, scale-like, its margins free, attached by its centre : first upper pinnule of each pair greatly larger than the second, and larger than the first and second lower pinnules ; all the ultimate divisions ending in an acute spine.

Obs.—The genus *Polystichum*, as proposed by Roth, is almost identical with *Aspidium* of Willdenow, but was subsequently restricted by Schott to the typical species, and those having a similar circular involucre. Although as regards British species the genus thus restricted is remarkably distinct, yet among exotic ferns we find species almost precisely intermediate between this and the following genus.

POLYSTICHUM ANGULARE.

Polypodium aculeatum, *Lightf. Fl. Scot.* 675 ; *Huds. Fl. Ang.* 459.

Aspidium angulare, *Willd. Sp. Pl.* v. 257 ; *Sm. E. F.* iv. 291, *E. B. S.* 2776 ; *Mack. Fl. Hib.* 339 ; *Hook. and Arn.* 568.

Polystichum angulare, *Newm. N. A.* 25, *F.* 173 ; *Bab.* 412.

Rhizoma tufted ; stipes one-third as long as the frond, densely clothed with large, red, chaffy scales ; frond drooping, graceful, broad lanceolate, lax, feathery, pinnate ; pinnæ very numerous, linear, distant, pinnate ; pinnules distinct, stalked, often distant, auricled at the base, rounded at the apex, serrated, spined.

Common in woods and shady lanes.

POLYSTICHUM ACULEATUM.

Polypodium aculeatum, *Linn. Sp. Pl.* 1552.

Polypodium lobatum, “affinis præcedenti (*P. angulare*, *l. c.*) an distincta sit species ?” *Huds. Fl. Ang.* 459 ; *With. Bot. Arr. Veg.* 651.

Polipodium aculeatum, *Bolt. Fil. Brit.* 48, t. 26. “*Polipodium lobatum*, *Hall. Hist.* 1712, and *Fl. Ang.* 459, is doubtless a young plant of *Polipodium aculeatum* ; of this I am certain from observation.”—*Bolt. l. c.*

Aspidium lobatum (Swartz), *Sm. E. F.* iv. 291; *Mack. Fl. Hib.* 338; *Hook. and Arn.* 568.

Polystichum aculeatum (Roth), *Newm. N. A.* 25, *F.* 169; *Bab.* 411.

Rhizoma tufted; stipes very short; frond rigid, horizontal, leathery, linear lanceolate, pinnate; pinnæ numerous, pinnatifid, divisions decurrent.

Common everywhere.

POLYSTICHUM LONCHITIS.

Polypodium Lonchitis, *Linn. Sp. Pl.* 1548; *Lightf. Fl. Scot.* 668; *Huds. Fl. Ang.* 455; *With. Arr.* 773; *Sm. E. B.* 797.

Polipodium Lonchitis, *Bolt. Fil. Brit.* 34, t. 19.

Aspidium Lonchitis (Swartz), *Sm. E. F.* iv. 284; *Mack. Fl. Hib.* 338; *Hook. and Arn.* 568.

Polystichum Lonchitis (Roth), *Newm. N. A.* 25, *F.* 163; *Bab.* 411.

Rhizoma tufted; stipes very short; frond linear, rigid, leathery, pinnate; pinnæ entire, auricled at the base, serrated, very spiny; clusters of capsules circular, crowded, often confluent, confined to the upper half of the frond.

On mountains, rare. Caernarvonshire, Durham, Yorkshire, Forfarshire, Perthshire, Kerry, Sligo.

Genus. — LOPHODIUM, *Newm.*

Involucre nearly circular, scale-like, its direction oblique to the plane of the frond, its margin with a conspicuous notch, and its attachment at this notch: first upper pinnule generally larger than the second, and always greatly less than the first lower pinnule: all the ultimate divisions ending in a point: cormus or rhizoma large, massive, and long enduring.

* *Frond deltoid; points of divisions spine-like.*

LOPHODIUM (RECURVUM) FÆNESECH.

1790. *Polipodium cristatum*, *Bolt. Fil. Brit.* 42, ad partem, *i. c.*, t. 23.

1832. *Nephrodium fœnesecii*, *Lowe, Camb. Phil. Trans.* iv. 7, ad partem, fortè omninò.

Aspidium dilatatum, var. *recurvum*, *Bree, Mag. Nat. Hist.* iv. 162.

1843. *Aspidium recurvum*, *Bree, Phytol.* i. 773.

Lastrea recurva, *Newm. N. A.* 23, *F.* 225.

Lastrea fœnesecii, *Watson, Phytol.* ii. 568; *Bab.* 411.

Aspidium spinulosum, *γ. Hook. and Arn.* 57.

Lophodium recurvum, *Newm. Phytol.* iv. 371.

Rhizoma tufted, large, crown unusually broad; stipes as long as frond, woody, clothed with long, narrow, lacinated scales; frond elongate, triangular (being exactly that of *Asplenium Adiantum-nigrum*), drooping, elegant, pale delicate green when young, its under surface sprinkled over with sessile, pellucid glands (which probably cause the powerful scent for which this species is remarkable), pinnate; lowest pair of pinnae longest stalked, all pinnate; all the divisions of the frond concave; involucre jagged, without stalked glands; clusters of capsules round, crowded, covering every part of the frond.

Common in Ireland and Cornwall; occurring in Devonshire, N. Wales, Cumberland, Sussex, &c. sparingly.

*** Frond linear-lanceolate; points of divisions spine-like.*

LOPHODIUM MULTIFLORUM.

Polypodium cristatum, *Linn. Sp. Pl.* 1551, ad partem; *Huds. Fl. Ang.* 390 (1762), (I place this synonyme here without hesitation, not simply from the accordance of Hudson's specific character, but because that author specially cites Hampstead Heath as the locality, and the present species has existed there from Hudson's time to the present, and no other form or supposed species has ever been found there); *Id.* 457, (1778); *Lightf. Fl. Scot.* 670; *Bolt. Fil. Brit.* 42, ad partem, (the second variety refers to this species); *With. Arr.* 778.

Polystichum multiflorum, *Roth, Fl. Germ.* iii. 87.

Aspidium dilatatum, spinulosum, and dumetorum, *Sm. E.*

F. iv. 292, 3, 4, and also of *Smith's Herbarium*, now in the possession of the Linnean Society.

Aspidium spinulosum, *Mack. Fl. Hib.* 340 ; var. β . *Hook. and Arn.* 571.

Lastrea dilatata, *Newm. N. A.* 23 ; *Bab.* 411.

Lastrea multiflora, *Newm. F.* 215.

Lophodium multiflorum, *Newm. Phytol.* iv. 371.

Rhizoma tufted ; stipes very stout, nearly as long as the frond, densely clothed with long pointed scales, which are dark brown along the middle but pale at the edges ; frond glandular when young, very large, deep green, drooping, ovate-lanceolate, pinnate ; lowest pair of pinnæ shorter than the second, third, fourth or fifth, pinnæ pinnate ; pinnales pinnate or pinnatifid ; ultimate divisions serrated, spined ; all the divisions of the frond convex ; involucre nearly circular, fringed with stalked glands ; clusters of capsules circular, covering every part of the frond.

Common everywhere.

Obs. — Two or more doubtful species of *Lophodium* occupy this place ; *viz.*, *L. glandulosum*, probably identical, as suggested to me by Mr. Moore, with *Lastrea maculata* of Deakin, *L. collinum*, &c. The characters of these are still insufficiently ascertained.

LOPHODIUM SPINOSUM.

Polypodium cristatum, *Linn. Sp. Pl.* 1551, ad partem.

1770. *Polypodium Filix-femina* γ . *spinosa*, *Weiss, Crypt.* 316.

1800. *Polystichum spinosum*, *Roth, Fl. Germ.* iii. 91.

Lastrea spinosa, *Newm. N. A.* 21, *F.* 209.

Lastrea spinulosa, *Bab.* 410.

Lophodium spinosum, *Newm. Phytol.* iv. 371.

Rhizoma stout, slowly but extensively creeping ; stipes as long as frond, clothed sparingly, except at the base, with broad, rounded, pale brown, diaphanous scales ; frond slightly drooping, elongate, linear, pinnate ; pinnæ rather distant, winged, pinnate ; pinnales at the base of the pinnæ separated from the midrib by a deep notch, towards the apex of the pinnæ decurrent, all lobed, the lobes serrated

and spined; divisions at the apex of the frond narrow, their terminations acute; all the divisions of the frond flat; involucre nearly circular, its margins waved, not torn, nor furnished with teeth or stalked glands; clusters of capsules circular, crowded, sometimes confluent, confined to the upper part of the frond.

Common in damp woods in England. I have not seen it from Scotland or Ireland.

Obs.—This very common fern has totally escaped the notice of Smith, Mackay, and Hooker and Arnott. Mr. Moore, in copying my figures of the paleæ and involucres of multiflora and spinosa, has unhappily transposed them. Babington is the only British author to whom I can refer.

LOPHODIUM ULIGINOSUM.

Aspidium spinulosum, var. *uliginosum* (*A. Braun*), *Döll, Rhein. Flor.* 17, 18. Vide *Phytol.* iii. 101.

Lastrea uliginosa, *Newm. Phytol.* iii. 679.

Lastrea cristata, var. *uliginosa*, *Moore, Phytol.* iv. 149, in *Rep. Bot. Soc. Ed.*

Lastrea cristata, *Bab.* 410, ad partem.

Aspidium spinulosum, *Hook. and Arn.* 571, ad partem. —

“The plant under the name of *L. uliginosa* in the Royal Gardens, corresponds with our *A. spinulosum*, α .”—*Hook. and Arn. l. c.* The plant here referred to as cultivated at Kew, is correctly named as my *L. uliginosa*; I mention this to show, from the evidence of all parties concerned, that *Aspidium spinulosum*, α ., *Hook. and Arn.*, and my *Lophodium uliginosum* are identical.

Lophodium uliginosum, *Newm. Phytol.* iv. 371.

Rhizoma tufted; vernation simply circinate, fronds erect, rigid, linear lanceolate, of two kinds, the fertile resembling those of the preceding, the barren those of the following species, pinnate; pinnæ also pinnate.

Not uncommon; bogs and boggy heaths, in company with the following species.

LOPHODIUM CALLIPTERIS.

Polypodium cristatum, *Linn. Sp. Pl.* 1551, ad partem.

1788. *Polypodium Callipteris*, Ehrhart, *Beitrage*, iii. 77, *Crypt.* 53; *Hoffm. Deutsch. Fl.* ii. 6.

1800. *Polystichum cristatum*, Roth, *Fl. Germ.* iii. 84.

Aspidium cristatum, Sm. *E. F.* iv. 289, *E. B.* 2125; *Hook. and Arn.* 569.

Lastrea Callipteris, Newm. *F.* 12.

Lastrea cristata, Newm. *N. A.* 21, *F.* 203; Moore, *Phytol.* iv. 149, ad partem; *Bab.* 410, ad partem.

Lophodium Callipteris, Newm. *Phytol.* iv. 371.

Rhizoma very stout, slowly creeping, often extending two or three feet; stipes branched, as long as the frond, sparingly clothed with short, broad, pale, semi-hyaline scales; frond very erect, narrow, linear, pinnate; pinnæ rather distant, short, somewhat triangular, pinnatifid, from five to eight pairs usually of the same length, but the fifth, sixth, seventh or eighth pair somewhat longest, and the others gradually approaching them in length, the distance between each pair gradually decreasing from the base towards the apex; pinnules generally decurrent, oblong, lobed, serrated, blunt or rounded at the apex, the lower pinnules generally larger and longer than the upper; involucre flat, its margin irregular; clusters of capsules crowded, often confluent, confined to the upper part of the frond.

On boggy ground, in Cheshire, Norfolk, Nottingham, and Suffolk; very local.

*** *Involucre more convex and more completely reniform; points of divisions obtuse.*—*Dryopteris*, Schott.

LOPHODIUM FILIX-MAS.

Polypodium Filix-mas, Linn. *Sp. Pl.* 1551; *Lightf. Fl. Sc.* 671; *Huds. Fl. Ang.* 458; *With. Arr.* 775.

Polipodium Filix-mas, Bolt. *Fil. Brit.* 44, t. 24.

Aspidium Filix-mas (Swartz), Sm. *E. F.* iv. 288, *E. B.* 1458; *Mack.* 340; *Hook. and Arn.* 569.

Aspidium cristatum, Sm. *E. B.* 1949; *Mack.* 340.

Dryopteris Filix-mas, Schott, *Fil.*

Lastrea Filix-mas, Newm. *N. A.* 19, *F.* 197; *Bab.* 410.

Rhizoma tufted; stipes short, densely clothed with reddish scales; fronds semi-erect, lanceolate, pinnate; pinnæ numerous, pinnate; pinnules blunt, serrated; involucre very perfect, without stalked glands; clusters of capsules less crowded nearer the midrib, absent from the lower pinnæ.

Common everywhere.

Obs.—Two apparent species, when better understood, may be introduced here, *Lophodium erosum*, the *Aspidium erosum* of Schkuhr, and *L. abbreviatum*, the *Polystichum abbreviatum* of Decandolle.

LOPHODIUM (RIGIDUM) FRAGRANS.

1753. *Polypodium fragrans*, *Linn. Sp. Pl.* 1089, (1st edition); *Huds. Fl. Ang.* 388, (1st edition); *With. Arr.* 650; *Villars, Hist. Pl. Dauph.* iii. 843.

1795. *Polypodium rigidum*, *Hoffm. Deutsch. Flor.* ii. 16.

1810. *Polystichum strigosum*, *Roth, Fl. Germ.* iii. 86.

Aspidium fragrans, *Gray, Nat. Arr.* ii. 9.

Aspidium rigidum (*Swartz*), *Hook. E. B. S.* 2724; *Hook. and Arn.* 569.

Lastrea rigida (*Presl*), *Newm. N. A.* 19, *F.* 191; *Bab.* 411.

Rhizoma tufted; stipes much shorter than the frond, densely clothed with reddish scales; frond semi-erect, glandulose, sweet-scented, lanceolate, pinnate; pinnæ very numerous; pinnules oblong, obtuse, serrated; involucre very perfect, fringed with stalked glands; clusters of capsules very crowded, covering the pinnules, absent from the lower pinnæ.

Not uncommon upon limestone rocks in the North of England.

Genus. — HEMESTHEUM.

Clusters of capsules on both branches of the lateral veins, and equidistant from the mid-vein, so as to form a continuous submarginal series, which, in the first division, is completely covered by the revolute margin of the pinnule; in the second division, nearly so: involucre instable, sometimes totally absent, at other times small, indistinct, subreniform, evanescent: first upper pinnule longer

than the first lower, both slightly longer than the second and following pinnules: ultimate divisions without a point.

Obs. — This genus has been carefully defined by Schott under the name of *Thelypteris*; but I object, for the reason before stated, to the transfer of a name from a species to a genus.

HEMESTHEUM THELYPTERIS.

Acrostichum Thelypteris, *Linn. Sp. Pl.* 1528; *Bolt. Fil.*

Brit. part ii. 78, t. 43, 44; *With. Bot. Arr. Veg.* 649.

Polypodium Thelypteris, *Linn. Mant.* 505; *Huds. Fl. Ang.*

457; *With. Arr.* 776; ? *Lightf. Fl. Scot.* 674.

Polystichum Thelypteris, *Roth. Fl. Germ.* iii. 77.

Aspidium Thelypteris (*Swartz*), *Sm. E. F.* iv. 285; *Mack.*

Fl. Hib. 340; *Hook. and Arn.* 569, (excl. syn. "E. B. 1018," which represents *G. Phegopteris*).

Lastrea Thelypteris (*Bory*), *Newm. N. A.* 19, *F.* 183; *Bab.* 409.

Thelypteris palustris, *Schott, Fil.*

Rhizoma creeping; fronds of two kinds, both erect, on long smooth stipes, lanceolate, pinnate; pinnæ pinnatifid, lower pinnæ equalling the rest in length; pinnules blunt, entire, in fertile fronds with convolute margins covering the capsules; lateral veins branched; involucre small, and present on scarcely more than half the clusters; capsules in circular clusters, scarcely marginal.

In marshes, very local.

HEMESTHEUM (OREOPTERIS) MONTANUM.

Polypodium fragrans, *Linn. Mant.* ii. 307; *Huds. Fl. Ang.*

457, (2nd edition). The reader will see that the altered description no longer agrees with *L. rigida*.

1781. *Polypodium montanum*, *Vogler, Diss. de Pol. mont.*

1788. *Polypodium Oreopteris*, *Ehrh. Beitr.*; *Dicks. Tr.*

Linn. Soc. i. 181, (1791); *With. Arr.* 775.

Polipodium Thelypteris, *Bolt. Fil. Brit.* 40, t. 22.

Polystichum montanum, *Roth. Flor. Germ.* iii. 74.

Aspidium Oreopteris (*Swartz*), *Sm. E. F.* iv. 286, *E. B.*

1019; *Mack. Fl. Hib.* 339; *Hook. and Arn.* 569.

Lastrea Oreopteris, *Newm. N. A.* 17, *F.* 187; *Bab.* 410.

Rhizoma tufted; stipes very short, chaffy; frond semi-erect, lanceolate, much attenuated at the base, pinnate; pinnæ pinnatifid, divisions rounded, lower pinnæ very short, deltoid, obtuse; veins and capsules as in the preceding; involucre sometimes quite obvious.

Mountains and moist woods, frequent.

Obs.—Each species is the type of a group of species, and might be regarded as a genus, but the intervention of *H. Novaboracense* tends very much to unite them.

Genus. — GYMNOCARPIUM, *Newman*.

Ultimate divisions of the frond with branched lateral veins free at the extremity, bearing clusters of capsules on all the branches: involucre none. In the British species the plant extends by means of a rapidly extending, slender, subterranean, stolon-like rhizoma.

GYMNOCARPIUM PHEGopteris.

Polypodium Phegopteris, *Linn. Sp. Pl.* 1550; *Lightf. Fl. Scot.* 669; *Huds. Fl. Ang.* 456; *With. Arr.* 775; *Sm. E. F.* iv. 282, *E. B.* 2224; *Mack. Fl. Hib.* 337; *Newm. F.* 115; *Hook. and Arn.* 566.

Polipodium Phegopteris, *Bolt. Fil. Brit.* 36, t. 20.

Aspidium Thelypteris, *Sm. E. B.* 1018.

Lastrea Phegopteris, *Newm. N. A.* 17, *F.* 13.

Polypodium ? Phegopteris, *Bab.* 408.

Gymnocarpium Phegopteris, *Newm. Phytol.* iv. 371.

Polystichum Phegopteris, *Roth, Flor. Germ.* iii. 72.

Rhizoma creeping; stipes long; frond ovate-deltoid, pinnate, drooping; first pair of pinnæ distinct, turned back, the rest united at the base, pointing forwards, all pinnatifid; veins, capsules and involucre as in the preceding; colour dull green; stem concolorous, rather scaly.

By mountain rills and waterfalls, and in wet woods: common in Scotland, North of England, and Wales; rare in Ireland.

GYMNOCARPIUM ROBERTIANUM.

1785. *Polypodium Dryopteris*, *Bolt. Fil. Brit.* 53, t. 1.

1795. *Polypodium Robertianum*, *Hoffm. Deutsch. Fl.* ii.

10. — “Fronde triangulari, foliolis ternis bipinnatis: pinnis pinnulisque inferne pinnatifidis. Stipes glaucus, uno latere sulcatus. Frons tenera. Uterque nudo oculo subtili tomento ad lentem brevissimis glandulis obsitus. Odor debilis Geran. Robert. Fructif. minuta.”—*Hoffm. l. c.*

1804. *Polypodium calcareum*, *Sm. Fl. Brit.* 1117, *E. F.* iv.

283, *E. B.* 1525; *Newm. F.* 131; *Hook. and Arn.* 567.

Lastrea calcarea, *Newm. N. A.* 17.

Lastrea Robertiana, *Newm. F.* 13.

Polypodium ? *calcareum*, *Bab.* 409.

Gymnocarpium Robertianum, *Newm. Phytol.* iv. 371.

Rhizoma creeping; stipes erect; frond elongate-deltoid, glandular-mealy; lower pinnæ bipinnate, upper pinnæ pinnate only; colour dull green, stipes concolorous.

Among loose stones in limestone districts, not common.

GYMNOCARPIUM DRYOPTERIS.

Polypodium Dryopteris. *Linn. Sp. Pl.* 1555; *Lightf. Fl.*

Scot. 678; *Huds. Fl. Ang.* 460; *With. Arr.* 780; *Sm.*

E. F. iv. 283, *E. B.* 616; *Mack. Fl. Hib.* 338; *Newm.*

F. 123; *Hook. and Arn.* 567.

Polypodium Dryopteris, *Bolt. Fil. Brit.* 52, t. 28.

Polystichum Dryopteris, *Roth. Fl. Germ.* iii. 80.

Lastrea Dryopteris, *Newm. N. A.* 15, *F.* 13.

Polypodium ? *Dryopteris*, *Bab.* 409.

Gymnocarpium Dryopteris, *Newm. Phytol.* iv. 371.

Rhizoma creeping; stipes erect, glabrous; frond triple, deltoid, smooth, the three branches pinnate; pinnæ pinnatifid; lateral veins usually simple; involucre generally wanting; clusters of capsules near the extremity of each lateral vein, forming a marginal series; colour a bright green, stipes purplish.

An exquisitely beautiful little fern. Common in mountain districts, otherwise rare.

Genus. — CYSTOPTERIS, *Bernhardi*.

Mid-vein of ultimate divisions distinct but sinuous, lateral veins branched, free: involucre attached almost beneath the mass of capsules, half-way between the mid-vein and the extremity, directed at first backwards, then upwards, then forwards, and almost covering the circular mass of young capsules like a hood, its anterior margin split into unequal and often capillary segments.

CYSTOPTERIS (MONTANA) ALLIONI.

1789. *Polypodium montanum*, *Allion. Pedem.* n. 2410.

Cyathea montana, *Roth, Flor. Germ.* iii. 100.

Cystopteris montana (*Link*), *Newm. Phytol.* i. 671, *N. A.*

15, *F.* 13 & 159; *Hook. and Arn.* 572; *Bab.* 413.

Rhizoma creeping; stipes erect, longer than the frond; frond deltoid.

Apparently a rare, certainly a local fern; hitherto observed only in Scotland. Found in 1836 on Ben Lawers, by Mr. W. Wilson: in a ravine called Corrach Dh'Ouflach, in 1841, by Messrs. W. Gourlie and W. Adamson: in the same place by Mr. Borrer and Dr. Walker-Arnott in 1850: and again by the Rev. W. Little in 1851.

Obs.—I think the name of *Polypodium montanum* was given to this plant against all the rules of botanical nomenclature, Vogler having given that name to another species eight years previously.

CYSTOPTERIS FRAGILIS.

Polypodium fragile, *Linn. Sp. Pl.* 1553; *Lightf. Fl. Scot.* 677; *Huds. Fl. Ang.* 459; *Bolt. Fil. Brit.* 50, t. 27 & 46; *With. Arr.* 779.

1762. *Polypodium rhæticum*, *Huds. Fl. Ang.* 458; *With. Arr.* 780; *Bolt. Fil. Brit.* part ii. 80, t. 45, but certainly not of *Linn. Sp. Pl.* 1552, as cited by early English authors.

1779. *Polypodium polymorphum*, *Villars, Dauph.* iii. 847.

1793. *Polypodium dentatum*, *Dicks. Crypt. fasc.* iii. 1, t. 7, f. 1, *Id. H. Sicc. fasc.* 16; *With. Arr.* 776.

1796. *Polypodium trifidum*, *With. Arr.* 779.

Cyathea fragilis, *Roth, Flor. Germ.* iii. 94.

Cystea fragilis, *Sm. E. F.* iv. 298, *E. B.* 1587.

Cystea dentata, *Sm. E. F.* iv. 300, *E. B.* 1588.

Cystea angustata, *Sm. E. F.* iv. 301.

Cystea regia, *Sm. E. F.* iv. 302, ad partem, *i. e.*, excl. the plant found on the garden-wall at Low Layton, which has not been gathered wild in Britain.

Cistopteris fragilis, *Mack. Fl. Hib.* 341.

Cystopteris fragilis, *Newm. N. A.* 15, *F.* 13, 149; *Hook. and Arn.* 572; *Bab.* 412.

? *Cystopteris dentata*, *Bab.* 412, ad partem, *i. e.*, excl. *Dickieanum*, *Sim.*

Rhizoma quasi-tufted, but increasing laterally; stipes shorter than the frond; frond erect, lanceolate, bipinnate; pinnæ ascending; pinnules distinct.

A small, elegant, and fragile fern, common in Wales, the North of England, Scotland, and parts of Ireland.

Obs.—*Cystopteris alpina* of Desveux, Hooker and Arnott, and Babin-ton, being also the *C. regia* of Smith in part, and the *C. incisa* of 'English Botany,' is not a true native.

CYSTOPTERIS DICKIEANA.

Cystopteris Dickieana, *Sim, in Gard. Journ.* 308, 1848.

Cystopteris fragilis, α . *Dickieana*, *Moore, Bot. Gaz.* i. 310.

Cystopteris dentata, *Bab.* 412, ad partem, *i. e.*, excl. *dentata*, *Sm.*

Rhizoma tufted; stipes much shorter than the frond; frond ovate-lanceolate; pinnæ crowded, overlapping, twisted as in *Polystichum Lonchitis*, scarcely pinnatifid, never pinnate, very broad and obtuse, their divisions slightly notched; clusters of capsules small, round, remaining distinct, submarginal; involucre generally wanting.

Rare; found by Dr. Dickie in a cave by the sea near Aberdeen.

Obs.—This little fern is better known to cultivators than to field-botanists. It has exactly the habit of a *Woodsia*: I only know it as cultivated, and then it appears perfectly distinct. It is reproduced readily from seed, and loses none of its distinguishing characters.

Genus. — *WOODSIA*, *R. Br.*

Mid-vein of ultimate divisions indistinct, lateral veins branched, free: involucre seated near the extremity of each branch, its base inclosing the base of the capsules, its margin split into capillary segments, which mingle with the capsules.

WOODSIA ILVENSIS.

? *Acrostichum Ilvense*, *Linn. Sp. Pl.* 1528.

Acrostichum Ilvense, *Huds. Fl. Ang.* 451; *Bolt. Fil. Brit.* 14, t. 9.

Polypodium arvonicum, *With. Arr.* 774.

Woodsia Ilvensis, *R. Br. Tr. Linn. Soc.* xi. 173; *Sm. E. F.* iv. 322, *E. B. S.* 2616; *Newm. N. A.* 13, *F.* 137; *Hook. and Arn.* 567.

Woodsia Ilvensis, *Bab.* 409, ad partem.

Rhizoma tufted; stipes sometimes as long as the frond, but generally shorter, distinctly articulated towards the base; frond erect, lanceolate, pinnate; pinnæ oblong, subopposite, lobed or pinnatifid, scaly.

A very small and rare fern. Found on rocks in Caernarvonshire by Mr. W. Wilson; in Durham by Mr. Backhouse; in Forfarshire by Mr. Watson and Mr. Wilson.

WOODSIA ALPINA.

Polypodium fontanum, *Herb. Linn. certè.*

1776. *Acrostichum Ilvense*, *With. Arr.* 649.

1790. *Acrostichum alpinum*, *Bolt. Fil. Brit.* 76, t. 42.

1793. *Acrostichum hyperboreum*, *Liljeblad, St. Tr.* 201, t. 8.

Woodsia hyperborea, *R. Br. Tr. Linn. Soc.* xi. 173; *Sm. E. F.* iv. 323, ? *E. B.* 2023; *Hook. and Arn.* 567.

Woodsia Ilvensis, *Bab.* 409, ad partem.

Woodsia alpina, *Newm. N. A.* 13, *F.* 143.

Rhizoma tufted; stipes shorter than the frond, articulated; frond narrow, linear, pinnate; pinnæ distant, deltoid, blunt, lobed.

A very small and rare fern. Found on rocks in Caernarvonshire and Perthshire by Mr. W. Wilson.

Genus. — ALLOSORUS, *Bernhardi*.

Mid-vein distinct, lateral veins free : involucre not apparent : capsules in circular clusters near the extremity of the lateral veins, which are often divided : epidermis prolonged, bleached, reflexed, entire, and covering the capsules in the manner of an involucre.

ALLOSORUS CRISPUS.

Osmunda crispa, *Linn. Sp. Pl.* 1522 ; *Lightf. Fl. Scot.* 655 ;
Huds. Fl. Ang. 450 ; *Bolt. Fil. Brit.* 10, t. 7.

Pteris crispa, *With. Arr.* 764 ; *Sm. E. F.* iv. 319, *E. B.* 1160.

Cryptogramma crispa, *Mack. Fl. Hib.* 343 ; *Hook. and Arn.* 575.

Allosorus crispus (*Bernh.*), *Newm. N. A.* 13, *F.* 103 ; *Bab.* 408.

Rhizoma prostrate ; stipes as long as the frond ; fronds of two kinds, both deltoid, and divided into numerous leaf-like stipitate divisions.

A small plant. Stony mountain regions in Scotland and the North of England.

Genus. — CTENOPTERIS.

Mid-vein distinct : lateral veins of the pinnæ or pinnules branched, free, swollen or capitate at their extremities ; the anterior branch simple, generally terminating midway between the mid-vein and the margin, bearing a cluster of capsules at its extremity ; the posterior branch is twice or thrice dichotomously divided, the capitate extremities usually forming a line parallel to the margin : involucre none : rhizoma usually attached by means of its roots to the surface of a rock, the bark of a tree, &c., thus always having a pseudo-parasitic or climbing appearance, cylindrical, branched, extending itself at the extremities, at first densely clothed with paleæ, but as these fall off becoming smooth and naked ; of slow growth, tough and very enduring, here and there marked with nearly circular scars, the site of fallen fronds, which, though persistent through the winter, are deciduous in early summer, falling off at a basal articulation. (See *Phytol.* ii. 274).

Obs.—This genus is indicated by Presl under the title of *Polypodium* § *Ctenopteris*, but I am not sufficiently acquainted with the host of exotic species which that author has placed in his sectional divisions to express any opinion as to their affinity. The genus, as restricted above, is sufficiently extensive, and has not, as far as my information extends, been previously isolated.

CTENOPTERIS VULGARIS.

Polypodium vulgare, *Linn. Sp. Pl.* 1544; *Lightf. Fl. Scot.* 667; *Huds. Fl. Ang.* 455; *With. Arr.* 773; *Sm. E. F.* iv. 280, *E. B.* 1149; *Mack. Fl. Hib.* 337; *Newm. N. A.* 13, *F.* 111; *Hook. and Arn.* 566; *Bab.* 408.

Polipodium vulgare, *Bolt. Fil. Brit.* 32, t. 18.

Polypodium Ctenopteris vulgare, *Presl, Tent. Pteridog.* 179.

Stipes articulated at the base, of nearly equal length with the frond; frond pinnatifid.

Walls, trees and hedge-banks, common.

Obs.—The *Polypodium cambricum* of all authors is referrible to this species.

Obs.—The beautiful *Davallia canariensis*, which, together with the extensive family to which it belongs, is intermediate between *Polypodieæ* and *Hymenophylleæ*, may possibly occur in the South-west of Ireland.

Family. — HYMENOPHYLLEÆ.

Frond appearing to consist of branched veins, each accompanied throughout by a membranous wing or margin: cluster of capsules nearly spherical, seated on one of these veins which projects beyond the edge of the leaf, the cluster being inclosed in a kind of cup-like involucre.

Genus. — TRICHOMANES, *Linneus*.

Involucre elongate, somewhat urn-shaped: capsuliferous vein projecting beyond it in the form of a long stiff bristle.

TRICHOMANES SPECIOSUM.

Trichomanes speciosum, *Willd. Sp. Pl.* v. 514; *Newm. N. A.* 29, *F.* 305.

Trichomanes brevisetum, *R. Br. in Ait. Hort. Kew.* v. 529; *Sm. E. F.* iv. 324; *Mack. Fl. Hib.* 344.

Trichomanes Europæum, Sm. in *Rees' Encyc.* xxxvi.

Trichomanes alatum, Hook. *Flor. Lond.* t. 53.

Hymenophyllum alatum, Sm. *E. B.* 1417.

Trichomanes radicans, (Newm. in litt. 1838, non Swartz);
Hook. and Arn. 576; Bab. 416.

Rhizoma hairy, creeping extensively; stipes about as long as the frond; frond pendulous, triangular, twice or thrice pinnate.

In Ireland only. Shaded wet glens and the vicinity of waterfalls in Cork and Kerry.

Genus. — HYMENOPHYLLUM, Smith.

Involucre shorter and rounder than in the preceding genus, and bivalved: the receptacle or capsuliferous vein not longer than the involucre.

HYMENOPHYLLUM TUNBRIDGENSE.

Trichomanes Tunbridgense, Linn. *Sp. Pl.* 1561; With.
Arr. 781.

? *Trichomanes pyxidiferum*, Bolt. *Fil. Brit.* 56, t. 30.

Trichomanes Tunbridgense, Huds. *Fl. Ang.* 461, ad partem.

Hymenophyllum Tunbridgense, Sm. *E. F.* iv. 326, *E. B.*
162; Mack. *Fl. Hib.* 345; Newm. *N. A.* 29, *F.* 321;
Hook. and Arn. 577; Bab. 416.

Rhizoma filiform, creeping extensively; frond drooping, pinnate; pinnæ alternate, composed of four or five alternate, dichotomously forked divisions, consisting, as in *Trichomanes*, of a membranous wing and a median stiff wiry vein, margins of the wing serrated; involucre in the axil of the pinnæ, flattened, serrated at top.

A small moss-like plant, growing on rocks, local.

HYMENOPHYLLUM UNILATERALE.

Trichomanes Tunbridgense, Lightf. *Fl. Scot.* 681; Huds.
Fl. Ang. 461, ad partem; Bolt. *Fil. Brit.* 58, t. 31.

1810. *Hymenophyllum unilaterale*, Willd. *Sp. Pl.* v. 521;
Newm. *F.* 14.

1830. *Hymenophyllum Wilsoni*, Hook. *Brit. Flor.* 446, *E.*
B. S. 2686; Mack. *Fl. Hib.* 345; Newm. *N. A.* 29, *F.*
325; Hook. and Arn. 577; Bab. 416.

Pinnæ secund, unilateral; involucre pear-shaped, entire at the top until mature, then dehiscent, the valves widely separating, otherwise as in *H. Tunbridgensis*.

A small moss-like plant. On rocks in mountain regions.

Order. — OSMUNDACEÆ, *R. Brown*.

Plants composed of fibrous roots, solid simple rhizoma, and flat leafy fronds which rise with a circinate veneration. Fructification upon a portion of the frond in which the veins alone remain, the parenchyma being apparently represented by clustered, globose, reticulated capsules, which are not provided with an elastic ring: involucre none.

Genus. — OSMUNDA, *Linneus*.

Characters those of the order.

OSMUNDA REGALIS.

Osmunda regalis, *Linn. Syst. Nat.* 1521; *Lightf. Fl. Scot.* 653; *Huds. Fl. Ang.* 449; *Bolt. Fil. Brit.* 6, t. 5; *With. Arr.* 763; *Sm. E. F.* iv. 327, *E. B.* 209; *Mack. Fl. Hib.* 345; *Newm. N. A.* 29, *F.* 331; *Hook. and Arn.* 578; *Bab.* 417.

Rhizoma very large, tufted; stipes woody, as long as the frond; frond nearly erect, and, including the stipes, four to ten feet high, pinnate; pinnæ opposite, spreading, pinnate; pinnules alternate, ovate, stalked, very entire; terminal panicle of capsules golden coloured, large, very conspicuous.

Wet places, very local.

Order. — OPHIOGLOSSACEÆ.

Plants composed of succulent and comparatively stout roots, some of which travel horizontally in the manner of stolons, succulent stipes, and branched fronds with straight veneration. Frond composed of two branches, the outer leafy, the inner, which it seems to inclose at its base in the manner of a spathe, entirely capsuliferous: capsules large, without reticulations, ring, or involucre, opening by a transverse fissure.

Genus. — BOTRYCHIUM, Swartz.

Frond produced annually *within* the base of the fertile frond of the preceding year: exterior or barren branch variously divided; interior or capsuliferous branch also much divided: capsules spherical, sessile, crowded.

BOTRYCHIUM LUNARIA.

Osmunda lunaria, Linn. *Sp. Pl.* 1519; *Lightf. Fl. Scot.* 652; *Huds. Fl. Ang.* 449; *Bolt. Fil. Brit.* 4, t. 4; *With. Arr.* 762; *Sm. E. B.* 318.

Botrychium lunaria, *Sm. E. F.* iv. 328; *Mack. Fl. Hib.* 346; *Newm. N. A.* 30, *F.* 337; *Hook. and Arn.* 578; *Bab.* 417.

Root stout, spreading, sparingly branched; stipes erect; fertile branch of the frond a racemose panicle, the barren branch pinnate; pinnæ three to seven pairs, flabelliform, with crenate margins.

A dwarf plant. Heaths, rather local.

Genus. — OPHIOGLOSSUM, Linneus.

Frond produced annually *exterior* to the base of the last year's frond: exterior or barren branch a simple undivided spathe; interior or fertile branch a simple, erect, stalked, pointed spike, in the substance of which two parallel series of large spherical capsules are embedded; these open by a transverse fissure, giving the spike a serrated appearance.

OPHIOGLOSSUM VULGATUM.

Ophioglossum vulgatum, Linn. *Sp. Pl.* 1518; *Lightf. Flor. Scot.* 651; *Huds. Flor. Ang.* 449; *Bolt. Fil. Brit.* 2, t. 3; *With. Arr.* 761; *Sm. E. F.* iv. 330, *E. B.* 108; *Mack. Fl. Hib.* 346; *Newm. N. A.* 30, *F.* 349; *Hook. and Arn.* 578; *Bab.* 417.

Stipes erect; fertile branch of the frond an erect, club-shaped, pointed spike; the barren branch an entire ovato-lanceolate leaf.

A dwarf plant, growing on heaths and in meadows.

